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NAME OF SUPERVISOR/*NOM DU DIRECTEUR DE THÈSE* Dr. D. Parker

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THE INFLUENCE OF CREE LANGUAGE BACKGROUND ON THE PERCEPTION OF ENGLISH CONSONANT PHONEMES IN FIRST GRADE CHILDREN

by

Ⓒ BONNIE BEVERLY REICH

A THESIS
SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
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THE UNIVERSITY OF ALBERTA
FACULTY OF GRADUATE STUDIES
AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled "The Influence of Cree Language Background on the Perception of English Consonant Phonemes in First Grade Children" submitted by Bonnie Beverley Reich in partial fulfillment of the requirements for the degree of Master of Education.

Douglas V. Parker
Supervisor

Marion D. Jenkinson

Lois Marckworth

Date: October 3 1978.

ABSTRACT

Two groups of students, one native and the other non-native, were given the Fast-Cosens Auditory Discrimination Test with additional items embedded to determine the effect of another language background on the performance of native children. The native students spoke a variety of English influenced by Cree. The non-natives spoke English only.

Added items for the Fast-Cosens Auditory Discrimination Test were selected on the basis of a contrastive analysis of the consonant phonemic systems of both English and Cree. It was anticipated that differences in these two systems would pose problems for the native students in the perception and discrimination of English consonant phonemes. As well, these students, being exposed to a limited model of English phonologically syntactically, semantically and functionally and coming from a non-verbal background, would find the auditory discrimination task particularly difficult as they wouldn't have the oral language background that promotes easier perception of sounds.

T-test analysis of performance on original Fast-Cosen items with respect to added ones indicated that the items based on the contrastive analysis were significantly (.05) harder for the native children. This would point out the influence of another language on their performance. For the white children, there was no significant difference in their performance on the Fast-Cosen items as compared to the added ones.

Two way analysis of variance of phonological categories and sub-categories indicated in the majority of instances that the native children fared significantly poorer in discrimination. However,

although they made more mistakes, their performance was often almost parallel in most categories and sub-categories, (12 of 17). That there were more errors could be attributed to the essentially non-verbal background they have and the limited model of English they have been exposed to. However, the parallelism suggests at least that these children seem to follow basically the same developmental pattern of the non-natives and possibly with further oral language experience the gap between the scores could be alleviated.

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CHAPTER 1

Introduction to the Study

The bulk of the research to date on populations of Indian descent has been carried out in the United States. With respect to the Amerind languages, the main concern of these studies has been with how to cope with children entering English-language oriented classrooms speaking other than English. However, there is a lack of information concerning the development of non-standard dialects of English derived from other languages. While attempts have been made to describe dialects such as the Mexican-American English of the Southwestern States (Williams 1971),and extensive research has been carried out on Black English, (Wolfram 1970), the varieties of English derived from Indian languages spoken in Canada have not been isolated and linguistically described and analyzed in any systematic way. In addition, there is little research which studies the influence of these dialects on pupil achievement.

Purpose of the Study

Since Oberg's study (1970) amongst others has indicated a positive relationship between auditory discrimination and success in reading, the purpose of the present study is to assess the auditory discrimination ability of Metis and Indian children in comparison to non-native children entering a Grade one classroom which employs Standard Canadian English. The children of particular interest are those speaking a variety of English flavored by the native tongue, in this study, Cree. A comparison will be made between the performance of native and non-native students on an auditory discrimination task.

Background of the Study

Definition of Terms

Indian: The term Indian refers to 'treaty' and 'registered' Indians. This includes Indian peoples who had signed treaties as well as those who had agreed to an arrangement whereby they were guaranteed benefits similar to those provided under the treaties (registered Indians). The Federal Government has responsibility for both of these groups of people (Kirkness 1973).

Metis: The term Metis refers to Indians who have relinquished their Indian rights completely and are not subject to federal jurisdiction, plus any descendant of Indian and white blood. Metis people fall under provincial control (Kirkness 1973).

Native: This term for the purpose of this thesis refers to Indian or Metis persons.

Language and Indian Education

A survey of Indian education across Canada for 1967 showed that on the average the Indian child is retarded two grade levels in comparison with his white counterparts and that twenty-seven per cent of such students had dropped out of school by Grade eight (Bowd 1972). Metis students in general suffer a similar fate although it is not as well documented (Gue 1971, Barber 1976). According to Barber (1976) and Ledgerwood (1972) the intervening years since the 1967 survey have offered little improvement. Factors affecting these children's achievement are numerous and complexly interrelated including among others, socio-economic status, cultural differences and language background (Hawthorn 1967).

It is the language background of the Indian child entering school that is of interest in this study; in particular, in those situations where the Cree-speaking Metis or Indian population's exposure to English has resulted in a variety or dialect of English that Hawthorn (1967) calls Indian-English. This dialect of English arises from the carry-over of phonological, syntactic and semantic features from Cree to English and from incomplete and faulty rule generalizations and applications in learning English (Richards 1970). As well, a different set of cultural attitudes and habits towards language usage has affected the type of Indian-English variety that has developed.

The possible influence of this non-standard dialect on the academic achievement of Indian and Metis children who supposedly know English, and the general unawareness of educators of the problems a child of a non-standard dialect has in the school environment elicited the following comment from Hawthorn (1967:129).

> ...although the child who speaks Indian-English is viewed as an English speaker by the school, in most cases he is as much in need of instruction in the language as the non-English speaking child.

The aforementioned studies indicate a need for research in this area. The present study attempts firstly to describe and compare the language milieus of native and non-native children respectively. Relevance of cultural attitudes and practices in language usage to academic success are discussed. After examining the overall development of Indian-English and the social and linguistic factors that have given birth to it, this study narrows its focus to the phonological influence of Cree on English. Since Cree and English have a different set of phonemes with their respective set of phonological features, a test of auditory discrimination will help determine whether or not some of the phonological rules of Cree are influencing the child's auditory discrimination of English consonant sounds.

Role of Auditory Discrimination In Reading

The literature in reading has indicated a positive relationship between auditory discrimination and reading achievement. A child can initially use a sight vocabulary, but a phonics approach is important for many children in establishing a sound-symbol relationship for deciphering words (Oberg 1970).

While auditory discrimination has been positively related to intelligence by some researchers, other studies find no significant relationship (Oberg 1970). However, in view of the population needed for this study, it will be difficult to select a test of intelligence that would be culturally fair, and the results of which could be meaningfully related to the performance on the auditory discrimination task (McArthur 1968). Existing I.Q. tests are focused on the intellectual components developed within our particular culture. These intellectual capacities may not be part of the intelligence repertoire of other cultures, and consequently members of these cultures fare dismally on the tests.

Certain studies have also indicated that socio-economic status is related to auditory discrimination. As Fast (1968) suggests:

> Different socio-economic strata may provide such varied experiences and practice in oral language that the auditory discrimination of students is affected and subsequently their reading achievement is affected (p. 143).

While children of lower socio-economic status tend to have poorer auditory discrimination than children of higher class groups (Fast 1968), relating the effect of socio-economic status to auditory discrimination in this study is difficult because of the linguistic background of the native sample and the influence of the native culture on pre-school language experiences (Hawthorn 1967). Previous studies looked at children from all levels of social stratification but with English-speaking cultural backgrounds. In this study the native population is likely to be part of the lower socio-economic group. However, the linguistic influence of Cree as well as the cultural patterns for parent-child interactions will likely be the most pervasive factors affecting auditory discrimination.

The Instrument

The only other known study concerning auditory discrimination involving a population of Indian descent was carried out in Southern Saskatchewan by Graham (1972) who reported no significant differences in the auditory discrimination of the Indian and non-Indian groups. Although she stated that the Indian sample spoke non-standard English and the white sample, Standard English, she gave no indication of there being another language influence that could affect the auditory discrimination task.

In her research, Graham used the Wepman Auditory Discrimination Test. One possible draw-back of this test is that it does not necessarily test the sounds that are problems for the Indian child. For example, Wepman makes no comparisons between voiced and voiceless stops, e.g. /p/ and /b/, as this feature from his studies was not a significantly difficult distinction for children to make. Cree does not have the contrast, ± voice, as a phonemic feature. The phonemes /p/ and /b/ are allophones of one phoneme in Cree. Secondly the Wepman Test has only one example for each phonemic contrast to which a choice of either of two responses can be given. This permits a strong possibility of guessing on the test.

For the present study the Fast-Cosens Auditory Discrimination Test will be used. This test was created by D. Fast (1968) and G. Cosens (1968) who felt that the Wepman Test did not make an extensive and intensive enough set of comparisons. It includes a wider range of minimal pair comparisons, and as well, more examples of each phonemic contrast are used to reduce random guessing.

To this instrument further contrasts will be added. These contrasts will be based on points of differences between the English and Cree phonological systems as well as on errors Soveran (n.d.) has isolated in native speech and written work. For the purpose of easy reference the total Auditory Discrimination Test comprising of the Fast-Cosen items and added items will be called the Fast-Cosens Plus Auditory Discrimination Test.

Hypotheses

I. There will be no significant difference in performance between the native and non-native group on:

a) the overall Fast-Cosens Plus Auditory Discrimination Test
b) the like word pairs
c) the unlike word pairs
d) the Fast-Cosens Auditory Discrimination Test itself
e) the added items section

II. There will be no significant difference in performance of the native group on the Fast-Cosens Auditory Discrimination Test as compared to the added items section.

III. There will be no significant difference in performance of the non-native group on the Fast-Cosens Auditory Discrimination Test as compared to the added items section.

IV. In the analysis of a) the phonological types, b) position and c) the bipolar feature, voicing, for the overall test there will be

(i) no significant difference in performance between the two groups on IV(a), IV(b) and IV(c). (the A main effect)

(ii) no significant pattern of relationships for both groups. (the B main effect)

(iii) no significant interaction in the performance of the two groups. (the A-B interaction)

V. (a) There will be no significant difference in performance between the two groups on one-position sounds.

(b) In the analysis of phonological categories and subcategories there will be

(i) no significant difference in performance between the two groups on each subcategory.

(ii) no significant pattern of relationships for both groups over the cells concerning position, or over the cells concerning the bipolar feature ± voicing.

(iii) no significant interaction in the performance of the two groups.

Design

Sample:

A group of native and non-native children entering a Grade one classroom will be used. The non-native children will have no other language influence besides English. Native students will be chosen from a strictly Cree background.

Procedure:

An audiometric test will be given to each child to determine those with hearing problems or disorders. Before the actual auditory discrimination test is given, practice sessions will take place in order to familiarize the children with the testing procedure.

Analysis of Data:

t-tests and two-way analysis of variance procedures will be used to examine the data.

Limitations:

Owing to the uniqueness of each community with respect to social situations and linguistic backgrounds, one should be cautious in generalizing from this study to other Indian and Metis communities or to communities of other language backgrounds.

Secondly most tests and testing procedures have been devised for and used on the white middle class element of North American society. The criteria used for these tests and testing procedures cannot be readily applied when obtaining information on another cultural group. Unfortunately it is questionable whether or not truly culturally fair tests and testing procedures can be devised. Further research and study needs to be done on this.

Significance:

If there is a difference in auditory discrimination ability between the two groups, teachers must be made aware of this difference as well as its significance for the native child who is learning to read, spell and acquire Standard English.

Summary:

The purpose of this research project is to examine comparative performance of a native and non-native group of children on an auditory discrimination test to determine whether or not the native language background influences the auditory discrimination ability of the native children.

CHAPTER TWO

REVIEW OF THE LITERATURE

A General Background to the Study

The purpose of this chapter is to establish a background against which the problem of auditory discrimination for Indian or Metis children entering Grade one can be appreciated. Firstly the native success rate in education is examined. Then the role of language will be established, first in its role in our culture and education, and then in its significance to native progress in learning at school. The development of functional ability (as defined by Tough, 1977, refer to Appendix A), semantic comprehension, syntactic structure and phonological discrimination is discussed with respect to their importance to reading.

Although the actual research contained in this thesis deals with children of Metis descent, the background research reviews information on both the Indian and Metis groups. It must be appreciated that both groups cannot be so easily lumped together, nor that each can be described exactly in terms of the other. However, there exist patterns in education and social adjustment that have similar implications for both groups. According to Gue (1971), Metis fare no better than most Indian groups, since provincial services are often spread very thin. In addition, Metis are often more Indian than White in their attitudes and learning styles (Gue 1971).

Native Success in Education

Statistical research on the native success rate at school is limited. The first major study of Indian and Metis children in Canada is contained in the Hawthorn Report of 1967. At that time severe age-grade retardation, poor attendance, low achievement levels, and high drop out rates were symptoms of a serious malady affecting native progress at school. According to Hawthorn, 94% of Canadian native students abandoned their studies by Grade twelve. In contrast, only twelve percent of the non-native element followed a similar course of action. Samples from the provinces revealed that as high as eighty percent of the Indian children repeated Grade one. Many repeated Grade one three times. Others under a continuous progress policy were passed despite lack of achievement in their beginning year. Often they managed to continue through Grades two and three before failing Grade four.

During the decade since the publication of the Hawthorn Report only minimal improvement in native education has occurred, since more recent figures (Barber 1976) reveal that a dismal rate of success still characterizes the native population. Projected statistics in Manitoba have been tabulated on the basis of previous data. In 1951-1952, 1.9% of the native population completed Grade twelve as compared to 33.9% of the rest of the student body. In 1957-1958, the percentage for natives rose to 5.4%, whereas 60.5% of other Manitobans achieved Grade twelve standing. It is estimated that by 1980 only 10.8% of the native children entering Grade one in 1967-1968 will finish Grade twelve. At that time approximately 90% of the rest of school population will do the same. The percentage of white Manitobans who will acquire a Grade twelve diploma equals the percentage of Indians and Metis who will not (Ledgerwood 1972).

In Alberta, based on 1970 data, although a slight decrease occurred in the drop-out rate for Metis students, the figures were still abnormally high (Ledgerwood 1971). Although the percentage of native children enrolled in high school has increased four times, their educational fate is only slightly better than that of Treaty and Registered Indians. According to a census survey taken by Jenson in 1966 in North Eastern Alberta, Indians had the lowest educational attainment of all ethnic groups. McCarthy in 1971 studied the problem of Indian graduates and dropouts in Alberta. He traced 120 students from Grade five, six and seven in the 1963-1964 school year through to the spring of 1971. Of the 120 students, 116 have not attained Grade twelve standing. Generally upon reaching school leaving age, these students dropped out usually during Grades eight, nine or ten. Metis students had a slightly better record in that they remained in school one or two years longer than Treaty Indians (Ledgerwood 1972).

While Barber (1976) has provided more recent data for Saskatchewan, his figures apply to registered (or status) Indians only.[1] As of the beginning of 1976 the following had been established:

1. For every Indian student in Grade twelve there are 14 in Grade one. In comparison, a ratio exists of four non-Indians in Grade twelve to five in Grade one.

2. Only 6.7% of the total Indian enrolment is to be found in Grades nine to twelve.

3. Sixty percent of the Indian student population is behind their proper grade for their age. Up to age nine they average two

---

[1] Status Indians are the direct responsibility of the Federal Government and information concerning their progress is more readily accessible than figures for the non-status Indians and Metis. Nevertheless, Barber claims that parallel sets of statistics could be determined for Metis and non-registered natives.

years behind. From ten years on they are generally 2½ years behind their non-Indian counterparts.

4. Of the Indian children beginning Grade one, less than five per cent finish Grade twelve.

5. During the history of the University of Saskatchewan only about twenty Indians have graduated with a bacculaureat. Less than five have acquired their Master's degree; none have received a Ph.D. (Barber 1976). On a national basis, only 1.7% of the native population over twenty has a University education compared with 11.9% of all Canadians (Grescoe 1977).

Summary

The ten year period since the Hawthorn Report has seen minimal improvement in native education. In comparison to provincial and national statistics for non-natives, the number of natives completing Grade twelve, let alone acquiring post secondary education, is low.

Language and Native Scholastic Success

The academic record of the native population may be attributed to a set of very complex and interrelated reasons. A prime one is the school's lack of sensitivity in its curriculum to the language a native child brings to school. This exists despite opinions supporting the need to recognize the difficulties these children have in employing English.

> There is agreement amongst educators supported by much evidence, that Native students lag behind in acquiring language skills and that the English language constitutes one of the greatest handicaps (Zintz, 1963:297; McKenzie, 1969; Sampson, unpublished; Hawthorn, 1966:140). According to the Department of Indian Affairs and Northern Development, almost 60% of the Indian children

> entering schools across Canada lack fluency in English ranging from a total absence of an English vocabulary to a vocabulary much below the functionary level (McKenzie, 1964). It is also generally agreed that the language handicap is prevalent among the majority of Metis students as well; this especially being true in the Northern regions of the prairie provinces. (Ledgerwood 1972:84)

The above description could apply very easily to the town of Lac La Biche in Northern Alberta. Teachers there estimated that 61% of the Metis children have language difficulties (Ledgerwood 1972). This percentage may be lower than the actual percentage as full fluency may not be accounted for, for the following reasons.

> There are large discrepancies between students' English vocabularies and their teachers' estimates of them. Inexperienced teachers and particularly those who have not studied a foreign language themselves tend to assume that a child who can carry on a possible social conversation can also understand what is being said in the classroom. Closer examination frequently reveals that the child has a very small supply of phrases in common use around the daily routines of school, play, store, etc. and an additional supply of nouns, verbs, prepositions and other esoteric items, which are crucial to making any sense out of school work, may be extremely scanty. (Knachman 1974:81)

The Indian Affairs Educational Field Handbook (Ledgerwood 1972) directly attributes the percentage of native children not promoted to the next grade in its Federal Schools to the second language handicap of Indian students. Bowd (1972) supports this in his statement:

> Irrespective of the diversity of cultural environments sampled in all the native groups, vocabulary appears as the prime determinant of grade level. However, the Indian child has usually had less opportunity for the development of English language skills, and their use as a criterion for grade advancement penalizes him severely ... (p. 74)

Summary

It appears that the language handicap is a serious one for native children. Their lack of competency in English language skills greatly hinders their progress at school.

Role of Language in Our Culture

This study will first examine globally the nature of this language problem before narrowing its concern to one particular aspect of it. Before discussing the problems of native language in the classroom, it is essential to establish how language is significant to success in the North American educational context.

Vygotsky (1934) attempts to describe the use of language as a tool in the structuring of cognition. According to him, thought and speech originate from two separate sources:

1. prelinguistic thought -- This is an array of sensations and perceptions that remain unprocessed. Whatever a child perceives or feels remains unnamed at this stage.

2. pre-intellectual speech -- The word at this point is just one more property of the object rather than an abstract symbol of it. A child makes sounds without associations to particular items or events in his environment.

At two years of age the two sources meet for the first time in the child through a mediate point, word meaning. Speech now actively begins to serve his intellect. He is curious about his surroundings and exerts a tremendous effort to learn words. Speech becomes his instrument to verify his perceptions about his world, enabling him to form categories that do not remain static. Further socio-cultural experiences and language interaction allow him to refine these categories. Ultimately the child passes from a concretely-oriented egocentric perception of the world through to the stage where he can make progressively more abstract categorizations, and determine tentative, casual and other types of meaning relationships.

In essence Vygotsky states:

> Thought development is determined by language i.e. by linguistic tools of thought and by the socio-cultural experiences of the child ... the child's intellectual growth is contingent on his mastering of social means of thought, that is language. (Vygotsky 1934:51)

The child entering school is still at an early stage of refining his world perceptions. He is present-oriented. The classroom is or should be an environment which facilitates his cognitive progression, one in which the child is active and verbal in his development of categories and relationships.

Joan Tough's research (1973) illustrates the significant relationship between the type of socio-cultural experience with language and the progression to more abstract thought. She has based her work on the social class findings of B. Bernstein. Bernstein (1971) had expanded the Sapir-Whorf hypothesis and had applied this theory to subcultures in society, i.e. social classes. He maintains that various social cultures exhibit differing ways of using language. This different pattern of language usage ultimately influences the types of attitudes, outlooks, meanings and values a social group attributes to everyday phenomena.

For example, the middle class is considered upwardly mobile and future-oriented. It analyses and plans alternatives to future projections. In raising its offspring it inculcates specifically and explicitly the attitudes, the mores and the motives that must be adopted for future alternatives. Language must be explicit and flexible to allow this.

In contrast the lower class members are more restricted in social opportunities. A status quo exists where traditions and routines are firmly established. Language is used to maintain common interests and unity. Strong traditional roles and social ritual play down the need for explicit and flexible verbal patterns.

After examining the language of both social groups, Tough established a set of criteria which centers on the use of language functions by each class to organize its own social world and cognition. (A list of the language functions and strategies are found in Appendix A).

> If we know little about the purpose for which children use language, we do know their interest lies not in the language itself: language is used because it helps them to achieve particular goals. Language serves their purposes and in doing so fulfills certain functions in their social and cognitive development. (Tough 1973:2)

The speech of children two to seven years of age was examined by Tough for their purposes in talking. Offspring of professional employees were compared to those of unskilled and semi-skilled workers. Generally the children of less educated parents lagged behind in their use of language. Language was employed by them more frequently to maintain and satisfy their own interests, to monitor their actions and to initiate and maintain relationships with peers and adults. Children of better educated parents showed more evidence of interpretive, predictive and empathetic purposes in language usage. Tough interprets these findings to be the direct result of the type of parent-child, especially mother-child, interaction that occurs in the family. The more learned or informed mother talks to her child in a manner that attempts to verify and extend the meaning relationship he has determined. She labels his environment, answers queries, explains her actions and decisions amongst other types of interaction. Furthermore, she asks questions that lead the child to make comparisons, examine his reasoning, establish reasons, et cetera.

In contrast the parent with less extensive education tends to be more concerned with controlling her child's behavior through language. Children are more often left to play with their peers; hence less interaction occurs with an adult model. Consequently these children seem less capable of functioning in a more abstract domain.

From experiments with various language tasks Tough has discovered that these children can use language for more abstract purposes, but only under the guidance of a sensitive, resourceful and provocative adult. This adult must be attuned to children's conversations in order to intervene and extend their ideas and meaning beyond the present activity. If there is no provocative adult at home then the teacher must assume this responsibility in order to enhance the child's intellect and language development.

The language functions and the respective subdivisions of language use and strategies that Tough identified are considered important to successful academic progress in our educational system. Children who frequently employ the range of functions in their speech perform better at school.

Tough's research verifies much of the study done to date on the language usage of different social classes. It also provides optimism to the challenge of working with lower class children.

For example, consider the children in Raph's study (1965). He had found similarly that the communication patterns of families of higher socio-economic status favored superior scores on tests concerning the various aspects of language. Children from low socio-economic background or minority groups fared poorly in the following ways.

1. They failed to attend to instruction.
2. Concrete demonstrations were needed.
3. They showed limited ability to label, discriminate, categorize and generalize.
4. They were less able to tackle intellectual and linguistic tasks.
5. A deficit in the auditory-vocal modality was revealed.
6. They showed a relative strength in visual-motor channels and relative weaknesses in auditory-vocal channels.

From Tough's interpretations it cannot be considered that these children are unintelligent. Rather they have not been exposed as the children of higher socio-economic strata have to similar types of language tasks in their interaction with parents. It would be difficult for them to attend to tasks which hold little relevance to home experiences. The presence of a provocative adult could facilitate the student's progress or development in these areas.

Summary

Strong evidence exists to support the point that the type of parent-child communication that evolves from culturally-held attitudes toward family relationships, especially mother-child, has a marked influence on all aspects of language development. Ultimately this influence is reflected in the child's ability to cope with reading and writing assignments in school.

Language and Cognition -- The Native Child

Anthropologists recognize the intimate relationship between thought and language, since the latter is the unique medium for expressing culture. Thought arises as individuals begin to structure the stimuli that they are exposed to from birth. It involves the selection of significant features and the organization of them into concepts. Memory aids the selection process in the refinement of concepts and categories as it serves to recall previous experiences and stimuli. These concepts are eventually expressed through language as a label serves to recall the elements of the concepts.

> An anthropological view of intelligence is that it is both learned and expressed within a cultural system. Ruth Benedict refers to this phenomena as the "language of culture," through which man develops, communicates, and solves his life problems. The cultural language is the total communication of group-shared beliefs and verbal and non-verbal language. The intelligence of the native child must be observed in this communication context. Behavior outside one's own system can appear unintelligent. It is generally accepted that much of basic intelligence is formed in early childhood, within a particular environmental program. Acuteness of mind rests within the first environment whether that be desert, jungle or Arctic snow. From this is born the resourcefulness and intellectual vigor that we hope will be the equipment of the child as he grows. This presents the dilemma that it may be difficult and sometimes impossible to utilize the full intelligence within the cultural system that nurtured the child. (Collier 1973:4)

However, the manner in which language facilitates the growth of intelligence in the Amerind child may differ drastically from the process that takes place in the child who grows up in Indo-European cultures. Vygotsky (1934) and Tough (1977) have defined models which delineate the role of language in the growth of intellect for only our cultural context. Tough has related how the quality of adult-child communication sets a pattern of success in school. The higher level functions are developed in parent-child communication where the child's meaning is constantly extended. This type of interaction between parent and child is of extreme importance to the area of comprehension in reading. The strategies of interpretation; recognizing sequence, prediction, imagination and empathy, all contribute to the understanding of what is read. If the child is encouraged to use these functions in oral language, likely the use of the same functions in reading comes more easily.

The functions Tough isolates as being essential to academic success may not be present in the native cultural communication context. The range of language uses and strategies have not been determined for the hunting-based culture of the native people. Griese (1974) and McArthur (1975) provide some insight into the nature of language and intelligence in native cultures.

Griese believes that a major reason native students fare so poorly is school is that they do not have the background of abstract thinking required of individuals in a literary culture. He does not attribute this deficit to heredity but rather to the fact that the native culture evolved out of the necessity to solve problems concretely. The harsh physical environment demanded immediate practical solutions. Consequently a leisure class never budded, a prerequisite to the development of a literary tradition. Written communication in a verbal society required the evolution of corresponding cognitive processes.

McArthur feels however that native intelligence is capable of not merely operating at a concrete level, but also at a higher level of abstract symbolic representation as indicated in his spatial-field independence and inductive reasoning tasks. This intelligence arises from the innate predispositions of these people interacting with the environment, and in the case of the native people's language it does not seem to play the same role in the development of intelligence as it does in the North American cultural context. McArthur found in studying natives of Canada that the abilities least influenced by differences in native and white backgrounds were determined on an inductive reasoning from non-verbal stimuli scale. Those most affected were on the verbal-educational factor. Therefore it appears that a large proportion of native intelligence is the consequence of developing perceptual skills in the distance and space of their environment. The cognitive skills developed as part of a verbal society are not naturally part of their intelligence repertoire, rendering them unprepared for our educational system and the expected abilities and skills.

As Collier (1973) indicates, when an individual has to contend with a task outside the experiences of his culture, his actions appear unintelligent to others. This has been the case with the administration of culturally normed I.Q. tests to other cultures. Minority and ethnic groups have been erroneously labelled inferior on the basis of these tests. Before the individual can cope with these testing tasks, he must develop the skills and cognitive expectations of the testing culture (McArthur 1975).

Summary

Language and cognition have been examined and described for an industrial society. However, the same theory cannot be applied readily to the native context. The role of language in cognition for hunting based cultures has not been determined. Since native intelligence has a large non-verbal component, children of these cultures are unprepared for the verbally-oriented atmosphere of white educational institutions.

The Status of English in the Native Context

A study of the pertinent research, e.g. Coombs (1971), Willink (1973), seems to suggest that children should learn in their native tongue in order that they may employ the medium through which their cognitive growth has been attained. However, many native communities have had long-standing exposure to white society, an exposure the effect of which varies from community to community as far as language is concerned. In many places the native child apparently speaks English with little or no native language background. However, the English that is learned from parental models may prove to be as great a hindrance to the child as being a monolingual speaker of the native tongue. His parents' English may be described as lacking the vocabulary, appropriate syntax, correct pronunciation, and background conceptual experiences needed to cope with the Standard English of the classroom (Knachman 1974; Ohannessian, 1972).

Often teachers are unaware that, although a native child speaks English at home and is unilingual, he may not have an exposure that permits him full competency phonologically, syntactically, semantically and functionally in that language.

> The impression of the study group is that being monolingual in English, apparently a goal that some educators have set for Indians in the past,

> has not always solved the educational problems of Indian students (Ohannessian 1972:14).

Richards (1970) offers insight into the native language dilemma in his discussion of Interlanguage. The acquisition of a second language proceeds in terms of approximate systems, which comprise the successive learning stages of the Target language as the learner goes from lack of fluency to full fluency. Each stage can be described by a particular grammar arising from the influence of the first language as well as interference from the learning strategies employed for the Target language. This acquisition can be viewed in terms of a continuum. (Richards 1970)

In proceeding along this continuum, social, economic and linguistic pressures can result in an interlingual stage becoming a terminal point for an individual or a community of speakers. As an example, bilingual groups like the Metis or Indian are generally members of the lower class in our society. Lacking the free access to the economic mainstream, social activities, and educational opportunities of our society, they remain in a context where full fluency in English is not needed nor particularly desired. In fact their particular brand of English can serve as an identification of their group status or membership.

Historically Indian and Metis English stemmed from the limited functions these people required in English during the fur trade era. More functions have evolved with exposure to white society.

The term 'diglossia' can be used to describe the situation in many native settings (Kjolseth 1973). English and the native language are employed for complementary purposes. English is used for business and the limited social contact with whites while the native tongue is used in other domains. However, a significant problem has arisen affecting many native communities.

> A number of the native people of North America have lost fluency in their own languages and are caught between an inadequate command of English and an equally inadequate knowledge of the traditional language. (Darnell 1971:155)

Members within a community may range in speaking skills from full fluency in English and the native tongue to almost a lack of any language for communication. While individuals in the community can be at different interlingual stages, the overall community can be described in terms of one particular area of the continuum.

The community of Calling Lake has been noted by Darnell (1971) as an example of such linguistic heterogeneity. Monolinguals in Cree or English are either young children or the aged and the fluency may range considerably from one individual to another. The parents of school children are either monolingual in Cree or English or bilingual. Again the range of fluency in either language is variable. According to Darnell a young child upon entering school has been exposed to four varieties of English.

1. Standard English - Standard English is not part of the native element but is rather the language of the school, media and business community.

2. Cree-English - This form of the language comes about as a result of the linguistic structure of Cree being imposed on Standard English. It also arises from the incomplete learning of English grammar. Children are exposed intensively to this variety of English prior to school entrance. As their parents have usually had limited experience in speaking Standard English, the English that they do use

is likely to have a limited range of functions and to be riddled with the interfering structures and sounds of both the native and target tongues.

3. Anglicized Cree - No native community exists any longer in its full traditional sense. The contact with white society has broken down traditional social, economic, political and religious structures. Consequently the use of Cree has become restricted to everyday communication with English influence imposed on it. Abstract thoughts in religion and mythology can no longer be expressed adequately. The full set of functions inherently part of the traditional milieu no longer exist.

4. Traditional Cree - Only the old native members have fluency in traditional Cree. In the past the aged orally passed on the stories and ritual of the culture. This occurs less and less frequently and eventually traditional Cree will die. Such Cree as will be used as a means of common communication will lack the flexibility to express ideas as subtly and precisely as does traditional Cree.

Summary

Most native communities are caught at some interlingual stage on the fluency continuum. It is only the occasional individual who acquires full competency in English. The interlanguage, Cree English, of the Metis and Indians may not possess the full set of functional uses that Tough deems necessary for academic success.

> Some of the problems of Indians in isolated
> communities lie in their apparent inability
> to use more than a limited number of levels
> and styles of English. (Ohannessian 1972)

Neither does the interlanguage model provide the syntactical, semantical, and phonological structures which are encountered in the

Standard English atmosphere of the classroom.

Cultural Factors Affecting the Interlingual Model

To understand the evolvement and maintenance of the interlingual model that a native child is exposed to, it is necessary to examine the social values and conditions under which is exists. The cultural interaction between the Indian or Metis child and adult seems to militate against the type of cognitive and language development essential to academic success in white society.

To illustrate the handicap under which a native child is forced to operate in an English school, Hawthorn (1967) offers examples of some basic cultural contrasts between the native milieu and the white one. The implications for language development are explored after each example.

White Middle Class	Native
A verbal society: Extensive verbal interaction occurs.	A silent society: Verbal interaction is limited. (Hawthorn 1967)

Implications: The overall orientation towards the use of language in the two societies is completely at odds. In white middle-class homes meaning is explicitly presented through language. Books are found in the home, and parents have established a practice of reading to children. Moreover, parents continually help the child to label items and events around him and to discover meaning relationships in his surroundings. This encourages the development of an abstracting process.

In the native home, however, existing verbal interaction may be limited to monosyllables. Meaning is implicit in non-verbal communication. As far as the use of English is concerned, the parental model that does exist has inaccurate syntactical and phonological features. Vocabulary acquisition is retarded. Few children may hear stories that were part of the oral tradition. It is not a literary society, so books are not of value.

Scientific Orientation:	Nature Orientation:
Children and parents try to be masters of their environment. Offspring are encouraged to be energetic and outgoing.	Members accept the environment and live with it. The children are passive and unexpressive by white middle-class standards. (Hawthorn 1967)

Implications: The middle-class point of view contributes to the development of certain types of language strategies inherent in the scientific bent of mind, strategies which Tough (1977) has identified as: forecasting events, anticipating consequences, surveying possible alternatives, forecasting related possibilities, predicting solutions, et cetera. All of these strategies play a role in strict scientific inquiry as well as being part of the white middle class perspective on life incorporated into its language patterns. Of course, the native background does not develop this type of perspective in the children through its language and cultural outlook.

Life is child-centered.	Life is adult centered.
Adults participate in children's activities.	Children participate in adult activities. (Hawthorn 1967)

Implications: In the native society, the child observes and quietly assimilates the roles and rituals of his environment. Much like the lower class milieu that Bernstein describes (1971), there is less need for verbal explicitness and flexibility.

Toys are accepted as being essential to the children's learning. Pets are anthropomorphized.	Toys are rarely present in the home. Pets are distinctive from the human personality. (Hawthorn 1967)

Implications: Children of western society through toys and pets are encouraged to engage in projective functioning especially in its empathetic and imaginative uses. Native children traditionally have not had this experience. Their play involves realistically acting out the roles they would assume as adults.

Children's behavior is controlled.	The child is autonomous. (Hawthorn 1967)

Implications: Firm control in western culture is established through verbal interaction. Constant verbal stimulation and feedback occurs between parent and child. In the native milieu, the child is exposed less frequently to an adult model. Consequently, the native child is less accustomed to verbal communication.

Parents are school oriented. They teach skills, explain and extend ideas that will facilitate progress at schools.	Education is not part of the native value system. Parents are usually unaware of skills necessary to schooling. Some time may be spent teaching skills and activities for life in the home environment. (Hawthorn 1967)

Implications: Children from middle-class homes feel more at ease in the classroom. They know the expectations and how to fulfill them. The native child cannot meet these expectations as they bear little relationship to what he has experienced at home. He is unfamiliar with the language cues, styles and levels appropriate to various social contexts.

The values of the middle-class family are those that the advantaged class Tough (1973) refers to would have. A child is an extremely important member of the household. He is provided with the toys, pets and situations for learning and through verbal interaction is encouraged to control the environment, to explore his surroundings, and to determine relationships amongst the stimuli. Children are led to be energetic, active and very verbal participants. This very same process is maintained in schools.

The values of the native society do not encourage parents to be any of the qualities of the provocative adult. Children are silent observers and participants in adult activities. At a very tender age, they become independent, being able to be absent from home without supervision and being able to make a decision as to where they would like to live. Hence, there is less opportunity for adult-child interaction.

Just how little verbal interaction is part of the native learning process has been documented by Phillips (1970). In native education the following steps are involved.

1. Observation of the Model: Minimal or no instruction is included, which contrasts with white society's concern for deliberate verbal explanations.

2. Period of Private Practice: The children practise on their own, making errors where they will not be seen. White culture emphasizes errors and their remediation as being significant in the learning process.

3. Demonstration of a Skill: The key point is demonstration. The native culture relies on action to indicate the acquisition of a skill or knowledge. Verblization is minimal.

Summary

Native children respond to non-verbal directional cues in performing a task. However, owing to lack of experience, they cannot employ language extensively to explain, describe, instruct, compare, analyze, predict, project, et cetera. Their culture does not promote that type of language experience. Hence, school tasks relying on this type of exposure are completely foreign to them.

Language and Reading

The fact that the native culture is essentially non-verbal with no literary tradition poses serious problems for native education in white culture. Being able to read competently demands certain prerequisite skills and abilities. The native child, owing to exposure to a parental model with a limited command of English and a culturally induced attitude towards the use of language, is penalized by the dominant attitude within the school system. His undeveloped functional, semantic, syntactic and phonological ability hinders his progress in reading.

Phillion and Galloway (1969) and Gordon (Graham 1972) have administered reading tests to native populations. The native child was found to lag behind non-native counterparts and to be reading at a level of frustration. While it must be remembered that the element of cultural bias in the testing instrument can depress the results of a population not of the testing culture, nevertheless, there are basic skills that must be acquired in learning to read and ultimately in being able to cope with the dominant culture.

> The construction and use of several tests of different facets of the English language have provided convinving evidence that these

> children do not have command of the English language with sufficient sophistication to use multiple meanings of common words, to respond to simple analogies, to interpret either idioms or slang expressions, and provide words of opposite meanings on a simple antonyms test or to provide elementary morphological or syntactical forms in English usage. (Zintz 1971:14-15)

Therefore the child's oral language performance functionally, semantically, syntactically and phonologically ultimately can affect his reading performance in decoding and comprehension skills.

Functional Ability and Reading

As discussed earlier, the quality of the child's oral language seems to be directly related to school achievement. Tough (1977) in testing an advantaged and a disadvantaged group of children with the Watts Sentence Reading Test found that the advantaged group performed much better on the comprehension and reading ability task. It appears also that native children having more exposure to the dominant culture perform better at school, since it is likely that they have assimilated a higher degree of the white societal values and customs, thereby preparing them more readily for school expectations. In an assignment for Education Curriculum 529 concerning the functions of an interlanguage, the author found that of three Grade two Metis boys tested, one of the boys provided a greater range of language uses. There was a greater number of higher level abstractions present for him than for the other boys. Investigation revealed that his father had a job in town and his mother was continuing her education at an adult vocational center. The parents of the other two boys did not have such direct contact with the white context of the town.

Gordon (Graham 1972) in a study comparing Indians attending an integrated school to ones at a residential school found that students in the residential environment scored lower in tests of reading, vocabulary and listening than did their counterparts in the integrated setting.

Similarly at the integrated institution, non-reserve Indians fared better on reading, vocabulary and listening tests that did the reserve Indian students. Scores for both groups were low, but non-reserve students scored higher.

Most native children are not raised in an environment where they learn the language functions and strategies listed by Tough that seem to aid in reading comprehension. As an example the literary language of the textbook often requires symbolic and abstract interpretations, a skill in which Griese (1974) found Eskimo and Indian children to be inadequate.

> Indian students do fairly well by comparison with the national norm until the intermediate grades and fall proportionately farther behind until by the twelfth grade the deficit is typically two to 2.5 grades. (Coombs 1971:25)

One reason for this may be that the readers used at the lower primary level are not based on literary English but on carefully controlled spoken English. In addition to a variety of pictures which aid comprehension, their vocabulary does not extend beyond 500 to 600 words. During late grade three, early grade four, a shift occurs toward literary English characterized by more complicated sentence structures and more difficult vocabulary (Blossom 1970). The student must be able to gather various cues and draw meaning from them. Essentially the child must use many of the strategies under interpretive and projective functioning that Tough (1977) had delineated for oral language. The child's experiential background, cognitive base and command of the oral language all lend themselves to helping him comprehend what he reads.

Semantics and Reading

Indian English is often characterized by a very limited vocabulary range. Children come to school unfamiliar with the labels for common items in their surroundings. In addition, the native culture has conceptual domains very different from ours. Words from one language could not adequately depict the concepts of another culture.

According to Payne (1972), in reference to native speakers of English, experience is vital to the development of a sound conceptual foundation. For a child whose background has other than the Indo-European influence merely learning labels for events and objects would be insufficient. He needs the experience of categorizing events as Indo-European children do. Without this, reading for the native child is a meaningless process of sounding out empty words. Until the child has had concrete experience with the concepts and equivalent vocabulary, reading remains at a level of mere deciphering without comprehension.

Syntax and Reading

From Tough's studies (1973, 1977) it appears that middle class children give more examples of extended noun and verb phrases. Lower class children produce extended phrases only when pressed. However if these children are not comfortable with complex structures orally, it is likely that complex sentence structures found in reading would pose problems for them. Children who have learned a variety of English with another language imposed upon it would likely find the involved syntax of Standard English to be confusing. Non-native speakers of English or learners of any second language often simplify the target languages' syntax in the stress of communication situations.

For example, Cree-English differs, of course, grammatically from Standard English. This leads to problems in comprehension where the concepts are embedded in the structure (Willink 1973). Children must be able to recognize the structural cues that signify more complex abstract relationships and concepts.

Phonology and Reading

Finally, it is the phonological element that is of concern in this thesis. The set of phonemes used in Cree differs from that of Standard English and their influence may be detected in the variety of Indian-English spoken, since many of the phonological elements of Cree are transferred directly to spoken English. The focus of this thesis is to determine whether this other language influence interferes with the native child's perception of English phoneme sounds. If the child hears sounds through a different set of criteria, his ability to associate symbols to corresponding sounds in the initial reading process can be hindered. Skill in auditory discrimination appears to play a significant role in initial reading success (Oberg (1970).

Summary

Language proficiency in all its dimensions plays an important role in reading at school. Hence those who are not language proficient can suffer in their academic achievement.

B. RELATIONSHIP OF AUDITORY DISCRIMINATION TO OTHER FACTORS RELATED TO THE READING PROCESS

Introduction

E.A. Betts (1963) identified nineteen factors that affect the success of students in beginning reading. Many of them could be studied extensively in themselves as factors affecting native success at school. The list includes: pre-reading school experience, social adjustment, interests and attitudes, chronological age, mental maturity, perceptions of relationships, memory span, background of information, home background, language facility, hearing, auditory discrimination, visual efficiency, visual discrimination, color discrimination, general health, motor control, neurological condition and sex difference.

Auditory discrimination has been selected for consideration in this study. For present research purposes it is defined as the ability to distinguish likenesses and differences in sounds presented in minimal word pairs. It is not to be confused with auditory acuity which is the ability of the ear to collect sounds and transfer them to the nervous system (Gavin 1972).

The research that has been done in general supports the belief that a child with poor auditory discrimination may have a handicap in success in beginning reading (Durell and Murphy 1953, Wepman 1961, Bond 1957). Bond in her master's thesis determined that children in schools employing the phonics approach to beginning reading needed better auditory discrimination skills than those pupils learning through a 'look and see' method (Gavin 1972).

After being in disfavor, the phonics approach has made a comeback in elementary classrooms. It relies on the child understanding that the sound pattern of a word is divisible into smaller sound units which are used in the formation of other sound patterns. Adequate auditory discrimination allows the child to hear separate sound units and to distinguish between similar ones. Inability to do so would hinder the association of a visual symbol to an auditory one, essential to the decoding process of reading (Dechant 1964; Fast 1968; Harris 1962; Wepman 1961). Some researchers have gone so far as to theorize that inadequate auditory discrimination can not only impede word recognition skills but also ultimately interefere with adequate word knowledge and higher levels of comprehension (Vernon 1957).

Other researchers found auditory discrimination to be related to reading scores in vocabulary and sentence and paragraph comprehension (Cosens 1968). Reid (1962) found sentence and paragraph meaning were slightly more related to auditory discrimination than word recognition.

Summary

Research has established a significant relationship between the skill of auditory discrimination and the ability to decode in reading. There are also researchers supporting a strong relationship between this skill and higher level processes in reading.

Auditory Discrimination and Auditory Acuity

One possible source of poor auditory discrimination ability may be a hearing impairment owing to injury or disease. Two types of hearing impairment have been identified. The first, a conductive impairment of hearing, involves a disorder of the outer or middle ear. The individual with such a dysfunction is still quite capable of adequate speech discrimination if the speech is loud enough to compensate for the conductive loss. The second disorder, perceptive impairment, takes place in the inner ear. There is a disturbance along the nerve pathways from the ear to the brain that affects the ability to discriminate speech sounds. Lower frequency sounds are generally perceived better. Therefore, inadequate auditory discrimination may be the result of hearing loss, though hearing impairment may be present without any effect on auditory discrimination ability (Newby 1964).

In lower-class and minority communities, ear infections and diseases are common owing to the conditions of poverty, poor personal hygiene and the lack of or ignorance of adequate medical facilities. This compounds the influence of other factors that can affect auditory discrimination (Grescoe 1977; Hawthorn 1967).

Auditory Discrimination and Intelligence

Despite various studies examining the relationship between intelligence and auditory discrimination, the information obtained is quite contradictory. Research generally agrees that a positive relationship varies with each study. This may arise from the type of auditory discrimination and intelligence tests being correlated. Though the ability to discriminate sounds has intellectual components they may not be fully determined by intellectual testing (Hall 1938; Poling 1968; Thompson 1963).

Thompson found high correlations between I.Q. and auditory discrimination factors. However, correlations between the two depend on whether verbal or non-verbal ability is being measured. Deutsch's studies indicated a higher correlation between the Wepman Auditory Discrimination Test and the Peabody Picture Vocabulary Test (verbal behavior) than between the Wepman instrument and the Lorge-Thorndike

I.Q. Test (non-verbal behavior). This perceptual and spatial ability is more highly related to visual skills (Gavin 1972).

Trying to correlate intelligence scores to those of auditory discrimination for native children could be very fruitless. Firstly, a completely unbiased I.Q. test for other cultures does not exist (McArthur 1975). Secondly, verbal scores for native children are usually very low owing to their non-verbal background. This aspect was the one more highly related to auditory discrimination.

Wepman (1961) found auditory discrimination to be comparatively independent of intelligence. However, he did notice that the more intelligent children acquired somewhat better scores and felt this to be because they focused better on the task. Attention is the 'capacity to direct and emphasize one's concentration on significant aspects of auditory discrimination while at the same time withdrawing from irrelevant ones' (Vernon 1962). Focus on attention during a task to appropriate stimuli is affected by the preschool environment and learning of the child (Wepman 1961). Of course, a different cultural background programs a child to attend to stimuli important in that cultural context. The effect of a child's language background on his success at school has already been discussed in Chapter two.

In addition, individual conditions such as health, state of fatigue, interest in the task and strength of motivation affect the ability to focus on particular stimuli while ignoring others. Children from a poverty-stricken background often suffer from malnutrition which affects their ability to focus on tasks in school. This aspect has been noted as a common trend in native communities (Ulibarri 1968).

Auditory Discrimination and Maturation

Since research (Poling 1968; Thompson 1963; Eagan 1970; Oberg 1970) indicates auditory discrimination to be developmental and influenced by training, there seems to be a greater correlation at the Grade one level between intelligence and auditory discrimination than at the successive levels (Deutsch 1964). From her studies Deutsch found that a minimal level of auditory discrimination is essential to developing verbal skills and reading. Once a child reaches this minimal level, the correlation between I.Q. and auditory discrimination is drastically reduced.

Native children, as would all children, experience maturational development in this ability. In discussing distinctive phonological features, Jakobson (Carrol 1961) maintains that a child follows a definite developmental sequence. Those features that are rarely found in the world languages are often the latest learned by children of the language groups in which the features occur. However, with respect to English, there would also be the influence of the native tongues for Indian and Metis children.

Auditory Discrimination and Socio-Economic Status

Various studies support a significant correlation between auditory discrimination and socic-economic status (Fast 1968; Mortenson 1967; Moffatt 1970). The rationale for these results has been based on the patterns of parent-child interaction that occurs in middle-class homes as compared to lower class ones. This aspect has already been discussed in Chapter two. In quick summary, it seems that there is a more extended verbal communication between parent and child in middle-class settings. This interaction prepares the child better for school expectations as he has a more extensive mastery of various aspects of the language; a more highly developed vocabulary, better organization of verbal meaning, a more complex syntax, more refined discrimination of sounds and extended practice in engaging in verbal learning with adults.

Clark and Richards (1966) have noted that the poor auditory discrimination of lower class children may be a result of their poorer attention span. They have neither the experience nor the opportunity to tend to listening tasks. Deutsch (1964), similarly, feels that adequate auditory discrimination is the consequence of experience and practice in listening to stimuli. The greater the variety of stimuli a child is exposed to the greater the likelihood of his being able to accommodate behavioral responses to this variety. The more that he has to cope with, the more he can cope with ultimately. In terms of oral language, the more varied the language experience the more the child can learn and distinguish in language tasks in school.

The native child's problem is compounded by his cultural and language background. The patterns of poverty reinforced by a non-verbal culture creates an environment where the child is limited in exposure to oral English. The model of English he does hear has been flavored by the native tongue. He is exposed to a certain set of sounds in his environment and has limited experience in distinguishing Standard English phonemes. On hearing new sounds children likely hear and reproduce the new ones in terms of the nearest equivalent in his own set.

The child in this situation has not developed the auditory discrimination which is necessary for learning to read because he has not had the needed corrective feedback. As conversation has seldom been directed at him, his general level of responsiveness and attentiveness to incoming stimuli may be lower than that of the child described in the middle-class situation.

The inaccurate perception of Standard English phonemes can impede the development of word attack skills. Decoding is an early skill in reading. Any hindrance to the development in the initial stage of reading could hamper overall mastery.

Auditory Discrimination and Sex Differences

The concensus of the research is not clear as to whether or not a subject's sex has a relationship to auditory discrimination ability. It has been cited that, since girls mature physically more quickly than boys, this may be the reason that they have had superior performance on auditory discrimination tasks in some experiments (Dykstra 1966; Wepman 1960). Also, it may be in reference to mother-child interaction that girls have the opportunity for more intimate interaction with their mothers. Their play sessions usually occur more often in close proximity to the mother, whereas boys are frequently out of immediate parental influence while playing. Other studies have shown no significant difference (Fast 1968) or have found boys to perform better on some tests (Cosens 1968). If boys do score lower initially they do seem to catch up in this ability (Reid 1962).

Sensory Modality and Auditory Discrimination

Auditory discrimination as required in learning sound symbol-letter symbol associations may be affected by a child having to operate in a weak modality, in this case the auditory. In the instance of the native child whose environment is essentially nonverbal and who learns through keen observation, it is likely that his visual modality will be stronger. Inexperience with a verbal context could imply that auditory discrimination would be a task to which he would have difficulty attending.

Auditory Discrimination and Bilingualism

Bilingualism has been indicated by Ewers (1950), Cosens (1968), and Gavin (1972) as affecting auditory discrimination. A child of another language milieu will have learned a set of phonemic contrasts whose phonological features may interfere with the perception of English phoneme sounds.

Summary:

Many aspects have been studied in relationship to reading and their possible association with auditory discrimination. Those aspects that have been recognized as positively related for a white middle-class society cannot be easily established for the native population. Cultural and language influences render this type of association unclear.

C. THEORETICAL FACTORS DIRECTLY AFFECTING THE DESIGN OF THE PRESENT STUDY

The Graham Study

The only other known study concerning auditory discrimination for a population of Indian descent was carried out in Southern Saskatchewan by Graham (1972), who used the Wepman Test of Auditory Discrimination. Although she stated that the Indian sample spoke non-Standard English and the white sample Standard English she gave no indication of there being another language influence that could affect auditory discrimination. Grade two and three students in an integrated school were given the Durrell Listening Reading Series and Kuhlman Anderson Test. On both tests the native element scored significantly lower than the non-native population. On the auditory discrimination tasks however there was no significant difference in performance between the two groups.

The implication would be that the native children had no more difficulty than the non-natives in distinguishing phonemic contrasts. One factor in Graham's study could be the age at which the auditory discrimination testing was done. There seems to be a decreasing number of children with poor auditory discrimination ability as age increases (Cosens 1968). By grades two and three, maturation and the learning of discriminations in phonics may have nullified any significant difference in auditory discrimination ability between the two groups. In addition, Fast (1968) and Cosens (1968) have criticized the Wepman Test as inadequately differentiating between children with poor auditory discrimination and those with good performance. They felt that the low positive correlations between auditory discrimination and reading achievement scores in some research studies utilizing the Wepman instrument justified their stand. One representative minimal word pair /pin-bin/ for a phonemic contrast /p/:/b/ does not seem enough. In addition, the Wepman Test is not an extensive test of possible phonological comparisons.

Auditory Discrimination Tests

Auditory discrimination tests have been criticized for various reasons (Poling 1968) such as the following:

1. Some test items do not really test speech sounds. For example, Ewers (Cosens 1968) tried to determine the correlations between oral and silent reading and musical rhythm.

2. Some instruments test only gross auditory discrimination ability. For example, on the Monroe Sherman Group Diagnostic Reading Aptitude and Achievement Test, the words of a single test are different in more than one way. Therefore distinguishing between two words is an easier task.

3. Other auditory discrimination instruments test more than one skill. On a test where a subject is given a stimulus word followed by four words, one being a repeat, and is asked to choose the repeated word, short term auditory memory as well as auditory discrimination ability is being tested. Certain auditory discrimination tests lack face validity as they involve skills other than the ones defined for auditory discrimination.

4. Some tests are poorly administered. For example, where the examiner orally gives the stimuli words, the children can read lips if precaution is not taken to hide the examiner's face from the view of the students.

5. Often the criteria for choosing test items are not specific or are poorly defined as in the Wepman Auditory Discrimination Test Manual.

Some studies that have tried to determine the relationship between auditory discrimination and reading achievement have used tests that could be measuring any of nine aspects of auditory discrimination.

Fast (1968) and Cosens (1968) examined research for all nine aspects to find which ones were particularly related to reading achievement; auditory fusion, rhyming, pitch discrimination, discrimination and orientation, discrimination in complex patterns, auditory rhythm, discrimination of similar sounds, composite auditory discrimination scores and word pair tests. Fast and Cosens identified the latter three types of tests as being the most significantly related to reading.

In the first of the three tests, the ability to recognize or produce words with similar sounds is measured. Although studies have related the results of tests, which focus on this aspect of auditory discrimination to reading, Dykstra (1966) found the results to be inconsistent.

Dykstra examined the Harrison-Stroud Making Auditory Discrimination Test and the Murphy-Durell Discrimination of Beginning Sounds Test to determine their relationship to reading achievement. Both involved basically the same skills. In the first test, the subject was required to draw a line between a stimulus picture and a choice of one of two pictures which had the same initial sound. In the Murphy-Durell Discrimination of Beginning Sounds Test the subject had to draw a cross on the picture that began with the same sound as the word orally given by the researcher. This second test did not significantly contribute to the prediction of reading success, whereas the first one was found second to I.Q. in being able to predict reading achievement. Dykstra failed to indicate as well that these subtests also involve visual recognition of pictures and are not pure tests of auditory discrimination. Using these tests for other cultural groups would result in biased findings.

Dykstra also examined the second type of test, composite auditory discrimination tests. He found that batteries of auditory discrimination tests yielded little to establish any more significantly the relationship between auditory discrimination and reading than did a single test.

Research employing the third type of test, word pairs, generally supported significant correlations between auditory discrimination and reading. Studies using the Wepman Test found significant positive correlations, supporting its use in identifying inadequate auditory discrimination (Cosens 1968). However, Fast and Cosens felt that the relatively low correlations of some research was owing to the fact that the test items did not adequately discriminate good from poor ability. As a result of this finding they devised a new test.

The Wepman Auditory Discrimination Test

Before examining the Fast-Cosens Test, the basis for the Wepman Auditory Discrimination Test will be described.

Based on his research, Wepman (1960) developed an auditory discrimination theory containing the following postulates:

1. Children easily misinterpret sounds that are closely alike in phonetic structure.

2. Each student differs in the ability to make speech discriminations.

3. Discrimination ability may mature as late as a child's eighth year.

4. There exists a strong positive correlation between the slow

development of auditory discrimination and inaccurate pronunciation. As a child's ability to discriminate improves, his speech does also.

5. A positive relation exists between auditory discrimination and poor reading achievement.

However, in devising his instrument, Wepman provided no criteria in his Manual of Directions for Auditory Discrimination for the selection of word pairs on his test. On analysis by Fast and Cosens it was determined that the following items were included:

1. all possible comparisons between voiceless stops
2. all possible comparisons between voiced stops
3. all possible comparisons between voiceless fricatives
4. odd comparisons between voiced fricatives and between vowels

Comparisons with the velar nasal /ŋ/, alveolar and alveopalatal voiced fricatives /z,ž/, affricates /č,ǰ/ semivowels /r,w,y/ and laterals /l/ were not included.

The Fast-Cosens Auditory Discrimination Test

In contrast to the Wepman Test, Fast and Cosens selected test items on the basis of children's articulation errors, discrimination errors and the frequency of phonemes in words.

Research has established a strong relationship between auditory discrimination and articulatory defects. Templin (1957) studied articulatory errors of children three to eight years of age. Nasals, most stops and some semivowels were acquired quite early by the children. Fricatives, affricates, semivowel /r/ and lateral /l/ were learned at a later stage.

Templin's study also identified the position in which articulatory errors occur most often, initial, medial or final. Children fared better on sounds in initial position than ones in medial or final. The most errors occurred for sounds in final position.

Templin also analyzed the percentage of her sample at various ages who had not mastered a sound in the various positions. At age three, ninety percent of her sample had mastered phonemes /n,t,g,m, b,d,w,h,p, and k/. Seventy to eighty percent could articulate /f, ŋ,l,s, and y/. Fifty to sixty-nine percent had acquired /v,r,š,ǰ, and č/. However, only ten to forty-nine percent could handle /z,θ, and hw/. By six the only sounds that could not be handled by ninety or more percent of the subjects were /š,s,θ,z,ž,hw, and č/ (Carroll 1961). As well from her study, Templin found that children could articulate voiceless sounds more easily than voiced ones.

Fast and Cosens used Templin's data in devising their instrument. They included sounds in any position that at least five percent of the children had not acquired mastery of by age six, the school beginning age.

The second area that Fast and Cosens examined was discrimination errors. The Miller and Nicely study (1961) categorized the discriminability of sounds under varying conditions of speech to noise ratio. Five features were isolated as cues for discrimination: voicing, nasality, friction, duration and place of articulation. It was found that voicing and nasality did not present problems for children and were not used as criteria in considering test items. The latter three were features that could offer difficulty for children and hence were included in test item selection.

The final area of consideration was how frequently certain phonemes occur in certain positions. According to Miller (Cosens 1968) fifty percent of the final consonants of words are comprised of five consonant sounds. He identified /n,z,v, and r/ but not the fifth phoneme. Eight consonants /w,j,h,b,g,f,p,ð, and θ/ make up fifty percent of the initial consonants (Cosens 1968). As some consonants do not occur often there were few items with these consonants on the Fast-Cosens Test.

The Fast-Cosens Auditory Discrimination Test only considered comparisons between consonant phoneme sounds. It seemed from Templin's data for six year olds that 95% had acquired mastery of vowels and diphthongs. In addition, vowels account for only 38% of English phonemes. Hence they were not considered in their study.

In designing their instrument Fast and Cosens used a number of representative word pairs for each phonological comparison. Like and unlike pairs were interspersed amongst each other. Like word pairs involved a repetition of the same word. /witch:witch/

Following are the phonological comparisons included on the Fast-Cosens Auditory Discrimination Test.

Phonological Comparisons Included on the
Fast-Cosens Auditory Discrimination Test

Comparison	Rationale
The velar nasal /ŋ/ was compared to nasals /m,n/ in medial and final position.	/m,n/ were mastered by 96.7% to 100% of the six year olds. Only five percent could articulate the velar nasal properly (Templin 1957). ∓ Nasality was not compared as Miller and Nicely (1961) had found it an easy characteristic to discriminate.

All possible comparisons were made in the group of voiced fricatives except for /z/ which is a rarely occurring phoneme in English. It was hence used in few comparisons.	95% of Templin's six year old group had not mastered voiced fricatives in any position.
All possible comparisons of voiceless fricative phonemes were made except for /h/.	Few of the voiceless fricatives were acquired by 95% of the six year old sample. 98% to 100% could handle the glottal fricative /h/ easily. Hence no comparisons were made with this phoneme.
Comparisons were made between fricatives and non-fricatives in similar places of articulation.	Miller and Nicely had found friction a difficult feature to discriminate.
Comparisons were made between affricates and fricatives in similar places of articulation.	95% of the children had not mastered affricates which are a stop quickly followed by a fricative (Templin 1957).
Comparisons were made between semivowels /r,w/ and lateral /l/.	95% of Templin's six year old sample could not handle the semivowel /r/.
Comparisons were made between voiceless stops in medial and final position and between voiced stops in final position.	Stops in initial and medial word position were mastered better than those in final position. The children found voiceless stops to be easier than voiced ones. (Templin 1957)

Summary

As can be seen from Table 1, the Fast-Cosens Test makes a more extensive set of comparisons than does Wepman. The expanded categories on this test allow better diagnosis of possible weak spots. As already indicated Wepman gave no criteria for selection of contrasts. Fast and Cosens have used previous research to make a careful selection of comparisons.

Secondly, Wepman used only one minimal pair comparison for each sound contrast. Subjects had a two choice answer for each item. A subject could get one-half of the items correct by mere chance. To

Table 1

The following table shows the sound contrasts that were made in the Fast-Cosens Test and in the Wepman Test.

PHONEMIC CONTRAST	F-C	W
STOPS		/t-/:/p-/
(voiceless)		/k-/:/t-/
		/p-/:/k-/
	/-p-/:/-t-/	
	/-p/:/-t/	/-p/:/-t/
	/-t-/:/-k-/	
	/-p/:/-k/	/-p/:/-k/
	/-t/:/-k/	/-t/:/-k/
(voiced)		/g-/:/b-/
		/b-/:/d-/
		/g-/:/d-/
	/-g/:/-d/	/-g/:/-d/
	/-d/:/-b/	/-d/:/-b/
	/-g/:/-b/	/-g/:/-b/
		/-m/:/-n/
NASALS		/m-/:/n-/
	/-n-/:/-ŋ-/	
	/-n/:/-ŋ/	
	/-m-/:/-ŋ-/	
	/-m/:/-ŋ/	
SEMIVOWEL-LATERAL		
COMPARISONS	/l-/:/r-/	
	/-l-/:/-r-/	
	/w-/:/l-/	
	/w-/:/r-/	
		/-θ/:/-f/
FRICATIVES		
(voiceless)	/θ-/:/f-/	/θ-/:/f-/
	/-θ/:/-s/	/-θ/:/-s/
	/s-/:/f-/	/s-/:/f-/
	/-s-/:/-f-/	
	/-s/:/-f/	/-s/:/-f/
	/š-/:/s-/	/š-/:/s-/
	/-š-/:/-s-/	
	/-š/:/-s/	/-š/:/-s/
	/š-/:/θ-/	/š-/:/θ-/
	/-s/:/-0/	/-š/:/-θ/
	/-s-/:/-f-/	
	/s-/:/-f/	
(voiced)	/v-/:/ð-/	/v-/:/ð-/
	/-v/:/-ð/	/-v/:/-ð/
	/-z/:/-ð/	
	/-v-/:/-z-/	
	/-v/:/-z/	
AFFRICATE:		
FRICATIVE COMPARISONS		
(voiceless)	/š-/:/č-/	
	/-š-/:/-č-/	
	/-š/:/-č/	
(voiced)	/-ǰ-/:/-z-/	
	/-ǰ/:/-z/	
	/-ǰ-/:/-ž-/	
FRICATIVE:		
STOP COMPARISONS		
(voiceless)	/-p/:/-f/	
	/p-/:/θ-/	
	/-p/:/-θ/	
(voiced)	/v-/:/b-/	
	/ð-/:/b-/	
	/-z/:/-d/	
	/d-/:/ð-/	
	/-d-/:/-ð-/	

minimize this, Fast-Cosens included three items on each like and each unlike word pair.

Thirdly, Wepman made comparisons for only initial and final word positions. As already discussed, initial sound positions were relatively easy in comparison to medial and final ones. In order to determine a full picture of the difficulties in various positions, the Fast-Cosens test included three sound contrasts for each of the initial, medial and final positions where possible.

On the basis of the above, the Fast-Cosens test was used as the foundation in which further test items were embedded for this study.

Item Selection on the Fast-Cosens Auditory Discrimination Test

Fast and Cosens ensured the validity of their minimal pair selection by checking the pronunciation of each member word of the pairs in The Gage Dictionary of Canadian English, the Beginning Dictionary. In addition they attempted to use member words in each pair as close to each other in familiarity as indicated by frequency of usage according to the Lorge-Thorndike Teacher's Word Book of 30,000 Words. The latter word control was used by the present author sparingly and with reserve. Firstly Fast and Cosens provided no criteria as to what constituted an acceptable range for familiarity equivalency. Secondly a word frequency book as such does not apply directly to a native population with another language influence. Very often the author, in research for a Education Curriculum 529 project, would find that the three Metis subjects involved in the study knew what an object could do but not the label for the object and at times not even the label for the action either. Often their lack of vocabulary involved very simple everyday labels.

In order to determine what items were to be used from a large sample of minimal pairs, Fast and Cosens ran a pilot study to determine criteria for item inclusion. Difficulty indices were established for each minimal pair and an acceptable range established. However, in order to have a standard number of items for each phonemic comparison sometimes items outside the accepted range were used.

Items added in the present study were not run in a pilot study as a population of equivalent interlanguage status was not available for a pilot run. Secondly the Fast-Cosens Test had not been run on an equivalent population to the native sample. Therefore, the difficulty indices established in their study may not necessarily be valid for such a native population.

Relationship of Fast-Cosens Auditory Discrimination Test to Reading Achievement

Fast (1968) found a significant positive relationship between reading achievement and auditory discrimination as measured by the Fast-Cosens Test at the .01 level. Cosens (1968) as well found the same level of significance for auditory discrimination and silent reading achievement.

Summary

Where possible the present research follows criteria and guidelines used in construction of the Fast-Cosens Auditory Discrimination Test.

The Fast-Cosens Auditory Discrimination Test was found by Fast (1968) and Cosens (1968) to be significantly related to reading achievement.

THE NATURE OF PHONOLOGICAL SUBSTITUTION PHENOMENA

As has been discussed previously in this chapter, an individual learns a second language in terms of approximate systems. The learner is subject to inter- and intra-systemic interference as well as socio- and psycholinguistic pressures. Intersystemic interference arises from the juxtaposition of two language structures, the target and mother tongues. The nature of intralingual errors have their source in the learning process. Overgeneralizations, incomplete rule application, and failure to restrict rule application for certain situations lead to intralingual interference. The learner in further exposure to the target tongue abandons some rules and refines others to attain the goal of complete fluency. Therefore a constant evolution identified by a successive set of grammars exist as one proceeds along the fluency line. As already established, minority groups often do not attain full fluent control of the dominant tongue. They are caught at some intermediate point in the continuum, and their speech habits can be identified in terms of an interlanguage grammar.

Phonetic Features of Source, Interlanguage and Target Phonemes

To describe the set of phonemes of an interlingual grammar some of which are substitutions for the target ones, each phoneme can be assigned sets of phonetic features in accordance with acoustic and articulatory parameters. Each feature can have a bipolar assignation of plus or minus to indicate presence or absence.

Phonetic Features (Cairns 1972):

1. Consonantal - If a speech sound is constricted along the oral chamber's centre line it is consonantal. Vowels and glides /w/, /h/, and /y/ are minus consonantal.

2. Vocalic - During vocalic sounds, the air flowing through the oral cavity remains unobstructed. /l/ and /r/ are consonantal and vocalic. Though production of them involves an obstruction in the central vocal tract, air is allowed to flow freely on either side of the tongue.

3. Anterior - If the point of articulation is from the alveolar ridge forwards to the lips and teeth, then the sound produced is considered anterior.

4. Coronal - Coronal sounds are produced with the front of the tongue.

5. Continuant - If a sound is made with no complete obstruction in the oral cavity, it is continuant.

6. Strident - Strident sounds involve air flowing through a narrow long constriction in the oral tract.

7. Voice - Articulation of voiced sounds results from vibration of the vocal cords in the larynx.

8. Lateral - /l/ is the only English lateral. It is produced when the corona of the tongue touches the roof of the mouth. The sides of the tongue are lowered to create an inverted groove.

9. Nasals - The oral tract is completely blocked to allow the air flow to proceed through the nasal cavity.

From research on students with misarticulation errors whose native tongue is English, as well as on foreign speakers of English, it has been found that the substituted phoneme is usually a variant of the target rather than being a completely new phoneme. The variant phoneme is a minimum number of features off the target and the substitutes are often of the same class of sounds as the target. Using this approach, the sound system of English can be represented as in Table II.

Table II

	Phonemes																							
Features	z	s	ð	θ	d	t	v	f	b	p	ž	š	ǰ	č	g	k	w	h	y	l	r	m	n	ŋ
Consonantal	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	+	+	+	+	+
Vocalic	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-
Anterior	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	+	+	+	+	-
Coronal	+	+	+	+	+	+	-	-	-	-	+	+	+	+	-	-	-	-	+	+	+	-	+	-
Continuant	+	+	+	+	-	-	+	+	-	-	+	+	-	-	-	-	+	+	+	+	+	-	-	-
Strident	+	+	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-
Voiced	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	+	+	+	+	+
Lateral	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
Nasal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+

(Cairns 1972, P.12)

The difference between the phonemes of Cree and English can be explained in terms of the presence or absence of certain features. The substituted phonemes that native children use in speaking or writing can be described similarly.

A Comparison of Cree and English Phonemes

To determine what phonological contrasts needed to be considered the work of Soveran (n.d.) and Wolfart (1973) were examined. Soveran compared the two phonological systems of Cree and English, as well as informally studying the errors that children of Cree background made in speech and spelling in English in order to define the problem areas for a native child hearing English phoneme sounds. Unfortunately a detailed error analysis does not exist for the variant phoneme sounds of Cree-English. This would provide a more sound foundation for minimal pair selection in adding items to the Fast-Cosens Auditory Discrimination Test. A disadvantage of such an analysis is that it may be only representative of the interlingual stage of a particular community and its information could not be generalized.

Following is a chart of English and Cree consonant phonemes, as well as a description of the contrast between the two systems in terms of the feature contents of the phonemes. In keeping with the Fast-Cosens test, solely consonant phonemes were considered in item selection.

	English Phonemes	Cree Phonemes
Stops	/p,b/ /k,g/ /t,d/	/p/ /t/ /d/
Fricatives	/s,z/ /š,ž/ /θ,ð/ /f,v/ /h/	/s/
Nasals	/m/ /n/ /ŋ/	/m/ /n/
Affricates	/č,ǰ/	/ts/
Semivowels	/w/ /y/ /r/	/w/ /y/
Laterals	/l/	

Stops

Absence or presence of voicing is a distinctive phonological feature of phonemes in English. There exist pairs of phonemes which are articulated in the same location of the mouth but differ in that only one member of the pair is produced with the vocal cords vibrating (+ voiced).

English

Voiceless	Voiced
/p/	/b/
/t/	/d/
/k/	/g/

/s/	/z/
/š/	/ž/
/č/	/ǰ/
/θ/	/ð/
/f/	/v/

This feature is distinctive in that it indicates a difference in meaning in minimal pairs. /pin/ has a different meaning from /bin/. This particular characteristic amongst the five that Miller and Nicely (1961) studies was found to be easily distinguished and therefore was eliminated in the minimal pairs selection for the Fast-Cosens Auditory Discrimination Test.

However, in examining Cree consonants, voicing is found not to be phonemic. The Cree stops are indicated by /p/, /t/ and /d/. They cannot be equated with the unvoiced phonemes of English. Rather /t/ in Cree includes any variant along a continuum from a purely voiceless /t/ to a voiced /d/. In other words, they are allophones rather than phonemes. A variant could conceivably sound halfway between the extremes. These variations by no means signal a difference in meaning to the Cree speaker. Therefore in learning English, the child with Cree influence in his background must learn to perceive this distinction. Hence in considering Cree stops /p/, /t/ and /d/, the voiced variants must be included. In her study Soveran gives examples of students not making the voicing distinction.

toboggan →	tibuken, tapakan, tipbogan, tapakan
description →	deskrebsen
guarantee →	carantee

Fricatives

a) The voiced-voiceless phonemic pair /f/ and /v/ do not occur in Cree. It may be difficult for Cree-speakers to differentiate them because of the voicing distinction. However, this pair is often confused with the English phonemic stop pair /p/ and /b/ which are produced in close proximity to /f/ and /v/.

examples: Joseph → Chosep
Vaseline → Baseline (Soveran, n.d.)

The substitution of /p/ for /f/ and /b/ for /v/ involves the absence of one feature, continuancy. The children stop the air stream passing through the oral cavity rather than allowing it to flow unobstructed.

b) Most dialects of Cree do not have the contrasting 'th' phonemes of /θ/ and /ð/. Again Cree speakers may be unable to perceive the distinction between the two easily until voicing becomes more discernableto them. As well, /θ/ and /ð/ do not occur commonly in world languages. Often, like most non-English speakers attempting to master English, Cree speakers substitute the stops /t/ and /d/ for the fricative pair (Soveran, n.d.). Again utilizing the phonetic feature paradigm, it can be seen that the substituted phoneme involves an absence of continuancy. English has nine fricative phonemes to Cree's one. A significant feature of fricative sounds is the presence of continuancy and since Cree does not use this feature for phonemes other than /s/, it may be of particular difficulty for people of that language background.

c) The Cree phoneme /s/ includes allophones from the English /s/ all the way back to /š/. The voiced alternatives do not exist phonemically. The feature that distinguishes /s/ from /š/ is ± anteriority. /s/ is an anterior sound; /š/ is not. A native of Cree background might say /püs/ for /püš/.

Nasals

The nasals /m/ and /n/ occur in Cree and are close in pronunciation to the English counterparts. /ŋ/ does not have phonemic status in Cree but can be heard in phonetic transcription as elisions of the /n/ phoneme for initial position during rapid speech. /ŋ/ differs from /n/ in two respects. It is - anterior and -coronal.

Laterals and Semivowels

/l/ and /r/ are foreign to most Cree dialects. Very often they are present in the names of the Metis which are often of French derivation.

Affricates

The closest equivalent to the voiceless affricate /č/ in Cree is /ts/ which ends on the/s/ phoneme rather than /š/. The basic bipolar feature difference is presence or absence of anteriority. A voiced counterpart is not present in Cree either.

Following are the comparisons added to the Fast-Cosens Auditory Discrimination Test and the rationale for their inclusion.

Voiceless Stop: Voiced Stop Comparisons

/p-/:/b-/	/-p-/:/-b-/	/-p/:/-b/
/t-/:/d-/	/-t-/:/-d-/	/-t/:/-d/
/k-/:/g-/	/-k-/:/-g-/	/-k/:/-g/

Since voicing is a non-distinctive feature in Cree, children of Cree background are likely to ignore more often the differences between voiced and voiceless stops than would non-natives. Therefore three items for each position of each pair of stops were included. Templin (1957) had found that children had the greatest difficulty with sounds in final position. However in the case of children with Cree background, /p/, /t/ and /k/ generally sound like the English unvoiced counterparts in initial and final position. In medial position the variant may be more influenced by the surrounding vowels and become voiced.

Cree also has vowel length as a distinctive feature. The fact that in English the vowel is longer before a voiced phoneme in final position may be a signal to the native child of words with significant differences in meaning. It is difficult to assess to what extent vowel length has been retained as a phonemic signal in learning English.

Nasals

All possible nasal comparisons between /ŋ/ and /n/, and /m/ and /ŋ/ have been made on the original test.

Semivowel: Lateral Comparisons

/-l/:/-r/

The comparison had already been made on the Fast-Cosens Test for initial and medial locations. These phonemes are not common to Cree. The final position comparison was included in the added items to determine relative performance in this category.

Voiceless Fricatives

/s-/:/š-/ /-s-/:/-š-/ /-s/:/-š/

These comparisons are already made on the Fast Cosens Test. The bipolar feature, ± anteriority, distinguishes the two phonemes.

Voiced Fricatives

/-z-/:/-ž-/ /-z/:/-ž/

/z/ and /ž/ are the voiced counterparts of /s/ and /š/. For individuals of Cree background /s/ and /š/ can be indistinguishable as they are allophones of the same phoneme in Cree. The feature in English that distinguishes them is ± anteriority. Though the voiced members do not exist in Cree, it may be difficult for the Cree person to discriminate between the voiced variants because the position feature (± anteriority) is difficult for the voiceless counterparts.

Voiceless Fricative:Voiced Fricative Comparisons

/θ-/:/ð-/ /-θ-/:/-ð-/ /-θ/:/-ð/

/f-/:/v-/ /-f-/:/-v-/ /-f/:/-v/

/s-/:/z-/ /-s-/:/-z-/ /-s/:/-z/

The pairs /θ,ð/ and /f,v/ are not present in Cree. The comparisons here are to determine whether the children hear the voicing distinction between the two. /s/ exists in Cree but as already mentioned includes allophones from /s/ to /š/. The three position comparison of /s,z/ will determine whether the children do perceive the voicing distinction.

Voiceless Affricate:Voiced Affricate Comparisons

/č-/:/ǰ-/ /-č-/:/-ǰ-/ /-č/:/-ǰ/

Again the phonemic feature ± voiced is outstanding for these comparisons which are not present in Cree.

Voiceless Affricate:Voiceless Stop-Fricative Comparisons

/-č/:/-ts/

The /č/ phoneme is of particular difficulty to the child of Cree background (Soveran n.d.). It begins as a stop /t/ and quickly slides into the /š/ fricative. However, native children speaking a Cree influenced variety of English often say /-ts/ for /-č/ by failing to move their tongue back in producing the fricative. It essentially involves the /s/ and /š/ distinction in final position.

Voiced Affricate:Voiced Stop-Fricative Comparisons

/-ǯ/:/-dz/

These comparisons are the voiced equivalents of the previous category and would therefore involve the bipolar feature ± anteriority as well.

Voiceless Fricative:Voiceless Stop Comparisons

/-p/:/-f/ /-p-/:/-f-/

According to Soveran (n.d.), /p/ is often substituted for /f/ by children of Cree background. /p/ is -continuant and /f/ being a fricative is +continuant.

/θ-/:/t-/ /-θ-/:/-t-/ /-θ/:/-t/

The stop /t/ is often substituted for the fricative /θ/. Again this means that +continuancy has not been mastered.

Voiced Fricative:Voiced Stop Comparisons

/-v-/:/-b-/ /-v/:/-b/

The /v-/:/b-/ comparison is already included on the Fast-Cosens Test. /b/ is often substituted for /v/. Again ± continuancy is the problem feature for the student.

/-ð-/:/-d-/

Comparisons between these two phonemes have already been included on the Fast-Cosens Test, in initial and final position. Again the problem bipolar feature is ±continuancy.

Final Consonant Clusters

The following category of comparisons were not included on the basis of phonemic features, but on the absence or presence of final consonant phonemes in consonant clusters. These clusters do not occur in the Cree language in final position and therefore according to Soveran's observations (n.d.) that native students have difficulty with them, it must be ascertained that the children of Cree background can hear the presence of the final consonant in the cluster.

±Stops After Sibilants

±t after š
±t after s
±p after s

[-t] is an allomorph of the past tense morpheme [ed]. The presence of this stop after sibilants in final position /wašt/ can indicate a past tense. Though it is not written as a consonant cluster, it is heard as cluster. As well /t/ comes in final position for words which are not verbs e.g. /past/. Both /p/ and /t/ in the final position provide difficulties for native children of Cree background.

± Stops or Affricate after Nasals

±k after n
±t after n
±p after m
±č after n

These clusters are not present in Cree in final position and children of Cree background may not hear the presence of the final consonantal phoneme.

±h in Initial position

Cree permits the presence or absence of /h/ in initial position without any change of meaning. This distinction may not be perceived in English.

Summary

Items were added to the Fast-Cosens Auditory Discrimination Test on the basis of a contrastive analysis of the English and Cree phonemic systems and an informal error analysis, as presented by Soveran (n.d.).

CHAPTER III

THE EXPERIMENTAL DESIGN

The Design of the Study

Administration of the Extended Fast-Cosens Auditory Discrimination Plus Test followed the same procedure that was used for the Fast-Cosens Auditory Discrimination Test.

The test items were taped by the researcher so that the subjects were exposed to the same quality, pitch, stress and time interval on all items. A sound-proof room was employed to prevent extraneous sound being picked up on the tape-recorder. Taping of word pairs eliminated any reliance by subjects on visual cues to discriminate sounds.

The test was administered to individual students on separate days. Each session had a break after each set of fifty words of three to five minutes; a total of 3 rest periods per session. During the breaks some brief activity was engaged in. For example, the researcher was aware that the principal took all the Grade one classes for gym. The children demonstrated some of the animal walks that they had learned during this period.

Before the actual testing, practice pairs were used to introduce the procedure. To indicate a difference in word pairs, the subject was asked to raise his hand. To indicate if items of each word pair sounded the same the subject kept his hand still. Practice items were included on the tape in order to accustom the subjects to the pace of the presentation of the minimal pairs. This pace had been given a trial run with four kindergarten children to determine whether they had time to answer.

The test was administered in the fall of 1975 in the school infirmary. Halfway through the second testing, this room was needed by the local health unit and the testing was moved to an old classroom used as an audio-visual room.

The elementary school chosen is in a small northeastern Alberta town of a very cosmopolitan nature. The school population is composed of individuals from Lebanese, Ukrainian, French and Italian backgrounds as well as of native extraction. The native language commonly heard in the area is Cree. The school board's centralization policy resulted in the busing of children up to fifty miles distance from the town itself. The elementary school had six grade one classes, a factor that prevented adequate development of tester-testee rapport. Informants supplied background information on language influence at home.

Auditory acuity scores for the Grade one population were obtained from the local health board. These tests had been administered during the two months previous to the gathering of data for this study.

No intelligence test was administered. There was no test to the author's knowledge that would be culturally fair and the results of which would bear a positive correlation to auditory discrimination. As already discussed in Chapter two the verbal component of I.Q. testing was positively related to auditory discrimination. This same component was a particularly weak area for children of native background.

An Occupational Scale was not applied either to the sample populations as the results could not be directly related to Socio-Economic Status because of the compounding influence of cultural and linguistic factors.

Sex and age of subjects were not considered as part of the analysis as the two samples were already dangerously small. Subgrouping could not produce any truly relevant results.

Test Sample

Sixty-one native children were distributed amongst the six Grade one classes. Thirty were included in the final sample, twenty-five Metis and five Indian students. To be included the students had to meet the following criteria.

1. The student had to have passed the pure tone audiometric test administered by the local Health Unit nurses during the September and October of 1975.

2. The subject had to be in his first year of Grade one.

3. The child had to be present for both parts of the testing. One child had been given the first half of the test but did not show up for the remaining three and one-half weeks the tester was present in the school.

4. No other language besides Cree could be present in the child's background. An adult native working as a liaison between the school system and the native community supplied information on the language background of each child.

The non-native group was selected from a population of 122 children. The following criteria were employed for their selection.

1. The subjects had to have passed the audiometric testing requirement.

2. They had to be in their first year of grade one.

3. No other language influence besides English was present at home. This automatically eliminated a sizeable proportion of the

non-native population. The cosmopolitan nature of this particular community has already been mentioned. An adult who had grown up in the community and who had been intimately involved in the administration at the elementary level served as an informant.

4. The subjects had to be present for both halves of the test.

Tests

Each child was given firstly an audiometric test by the local health unit and had to be cleared for adequate hearing before taking the Fast-Cosens Plus Auditory Discrimination Test.

Statistical Treatment

t-test and two-way analysis of variance procedures were used in analyzing the data. To compare the mean proportion scores of the two samples on one aspect of the test, the t-test procedure was used. Where categories and subcategories were compared on more than one cell the two-way analysis of variance was run. The A main effect indicated whether or not the difference in performance between the two populations was significant. The B main effect gave the significance of the relationship between the cells over the two groups. The A-B interaction was also given.

Summary

A group of 30 Grade one native children and 27 Grade one non-native children were selected for the study. Each child had to have passed the local health board's audiometric testing. The native children were selected from Cree backgrounds where no other language influence besides English and Cree was present. Non-native children were chosen on the basis of English being the sole language spoken in the home. The Fast-Cosens Plus Auditory Discrimination Test was administered over two separate days to these subjects. t-test and two-way analysis of variance procedures were used to analyze the data.

CHAPTER IV

ANALYSIS OF DATA AND INTERPRETATION OF RESULTS

Overall Test Performance

In this chapter the data obtained from the administration of the Fast-Cosens Plus Auditory Discrimination Test will be examined and analyzed. First an analysis will be made of the performance of each group on the total test. Items will be then divided according to whether they are like or unlike pairs and the comparative performance of each group on each category will be assessed. Next the various sound categories will be examined to determine if certain categories are more difficult for both groups. Finally, each group's relative performance is assessed.

The data derived from the overall test will be reorganized and reanalyzed to provide information on the effect of (1) position and (2) the bipolar phonemic feature, ± voicing, for each and both groups.

Specific Test Performance

Section I. To give more specific information, the general phonological categories are broken down on the basis of voicing where possible. For example, stops are divided into (1) Stops - voiced comparisons, (2) Stops - voiceless comparisons, and (3) Stops - voiceless:voiced minimal pairs. Nasals are of course all voiced and are considered as one large group. Performance is assessed on the three possible positions for comparisons to be made within each category or subcategory.

Section II. Then the phonological categories, like stops, are treated on the cells, (1) voiceless, (2) voiced, and (3) voiceless:

voiced comparisons to determine the pattern of the performance for each and both groups.

Finally each phonemic contrast, e.g. /p/:/t/, in each position tested is examined to determine how many children in each population had the total number of minimal word pairs of that contrast correct.

Presentation of Statistical Information

t-test information is presented in table form along with the discussion of the data. This information was obtained on the number of items correct for each group for the variable under consideration.

For the two-way analysis of variance procedure, mean proportion scores of the number of items incorrect for each group were employed. Mean test scores could not be directly compared as there was not an equal number of comparisons made in each cell of each category or sub-category. For example, if stops had seventeen items and nasals four, the number of errors for each group had to be divided by the total number of items present in that category in order to arrive at an equivalent basis for comparison. Graphs were drawn using the mean proportion scores.

To present information obtained through a two-way analysis of variance, graphs plus tables summarizing the analysis of variance are used. On each graph the dotted line represents the Metis group and a solid line the non-Metis sample.

A single asterisk will indicate significance at the .05 level and double asterisks will be used for figures significant at the .01 level.

Performance and Distribution of Scores in Each Group on the Fast Cosens Plus Auditory Discrimination Test

The Fast Cosens Plus Auditory Discrimination Test was administered to two groups of children, 30 native and 27 non-native. Graph (I) shows the relative distribution of scores for the two populations. The total possible correct on the test is 389; 255 unlike plus 134 like pairs. On the overall test the performance of the non-natives is better than the natives at the .01 level of significance (Table III). The range within the native group extends from 203 to 362 correct, with a mean of 307.03 and a standard deviation of 48.86. Within the non-native sample the lowest score is 245, the highest 379. The mean for this population is 343 and the standard deviation 33.54.

Table III

The Fast-Cosens Plus Auditory Discrimination Test: t-test summary between Groups

Variable	Mean		df	t	P
	Native	Non-Native			
Fast-Cosens Plus Auditory Discrimination Test	307.03	343	55	-3.2	.01

As can be observed from Graph I the native children's scores are skewed to the left while the non-natives are skewed to the right.

The items were then divided into like and unlike word pairs. Graphs II and III show the range of scores for the two categories.

As can be seen from Table IV there was no significant difference between the two groups in their performance on like word pairs. Graph II reveals that the median score for the native group is only slightly higher than that of the non-native .

Graph I Distribution of Scores on the Fast-Cosens Plus Auditory Discrimination Test

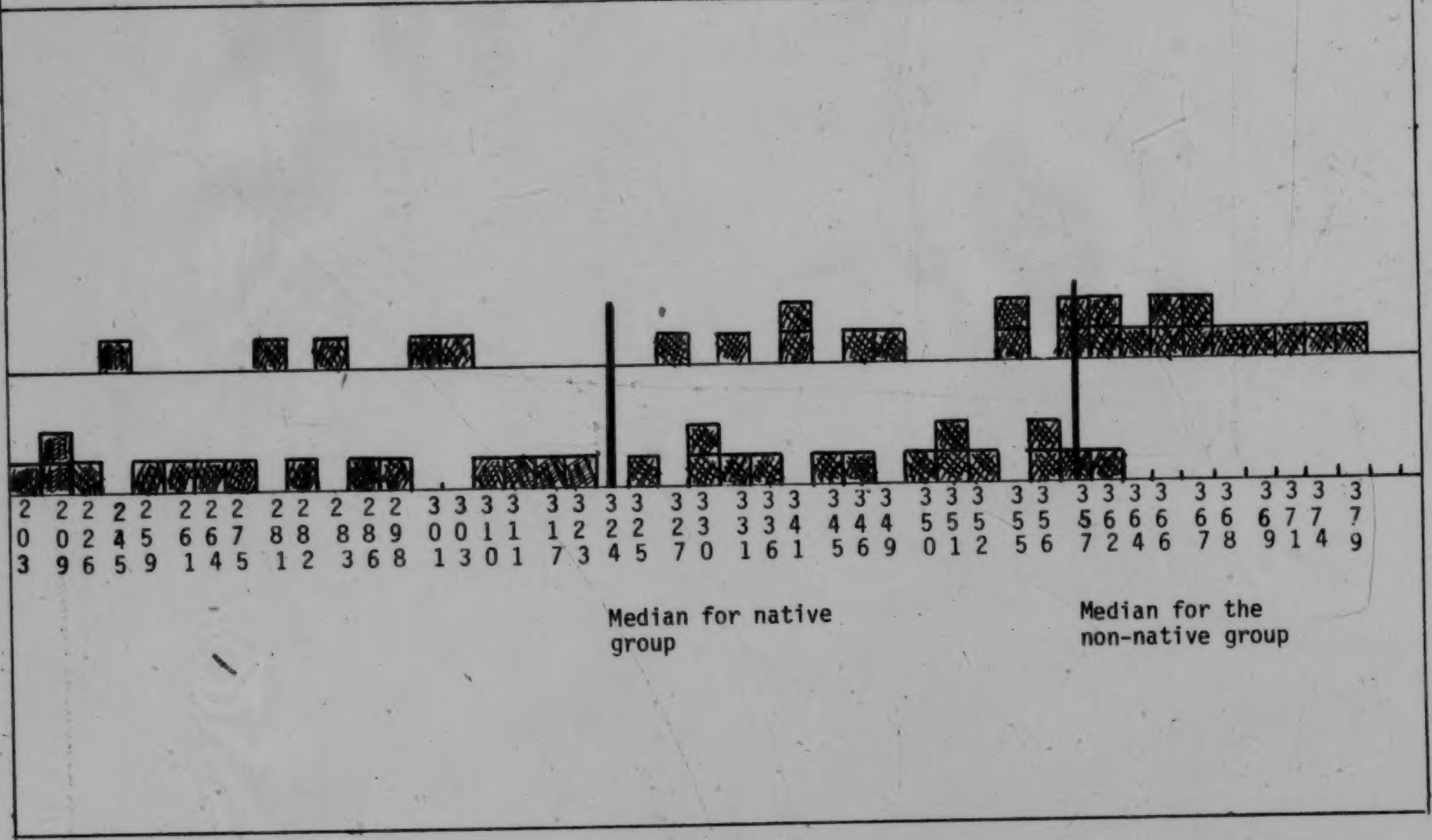


Table IV

Like Word Pairs: t-test Summary Between Groups

Variable	Mean		df	t	P
	Native	Non-native			
Like Word Pairs	123.33	122.55	55	.49	not significant

On the minimal pairs or unlike word pairs the non-native sample did better at the .01 level of significance.

Table V

Unlike Word Pairs: t-test Summary Between Groups

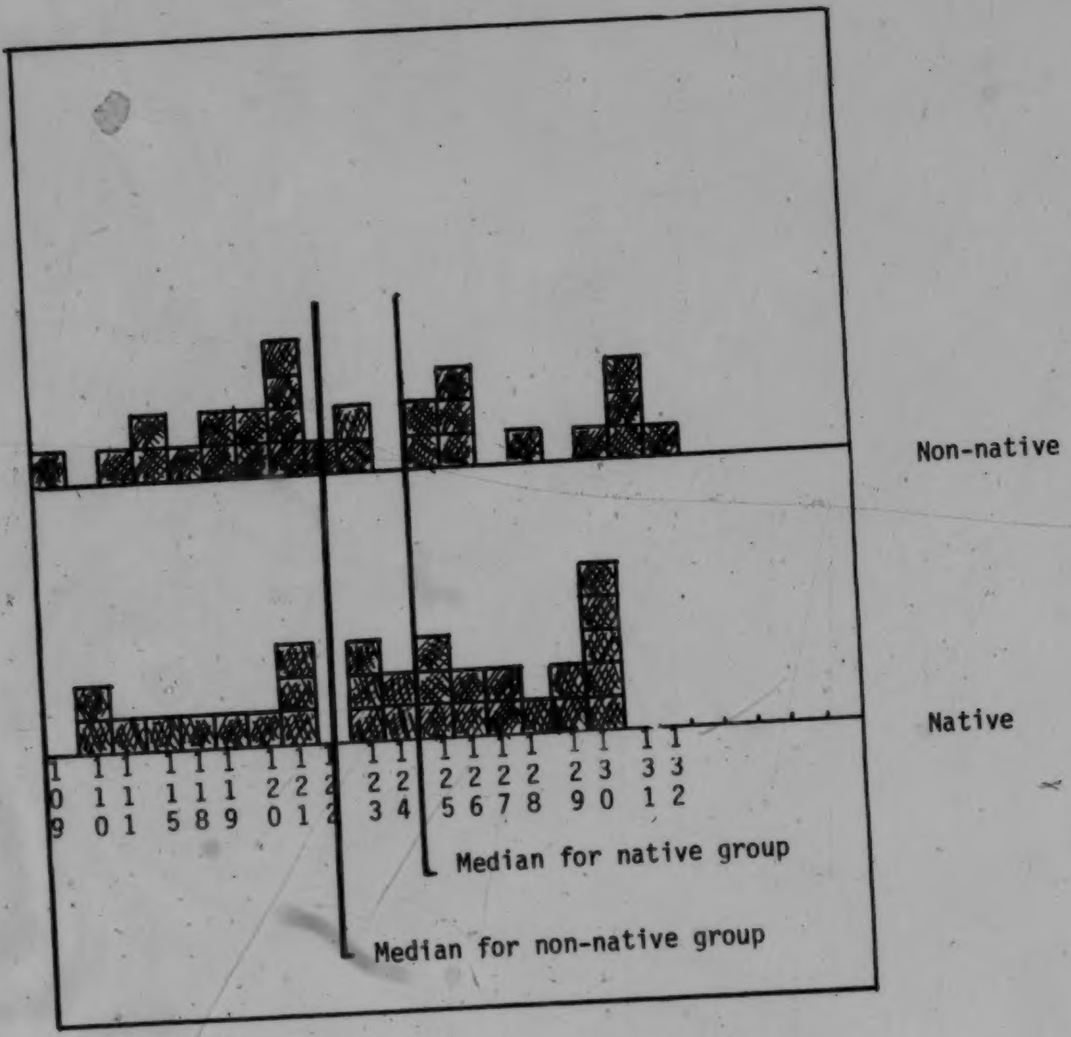
Variable	Mean		df	t	P
	Native	Non-native			
Unlike Word Pairs	183.63	221.40	55	-3.26	.01

In examining Graph III, it can be seen that the median score for the non-native group is 234. Only three native children or 10% of that population scored higher than that number. The median score for the native group is 201. 18.5% or five of the twenty-seven white children scored below the native median.

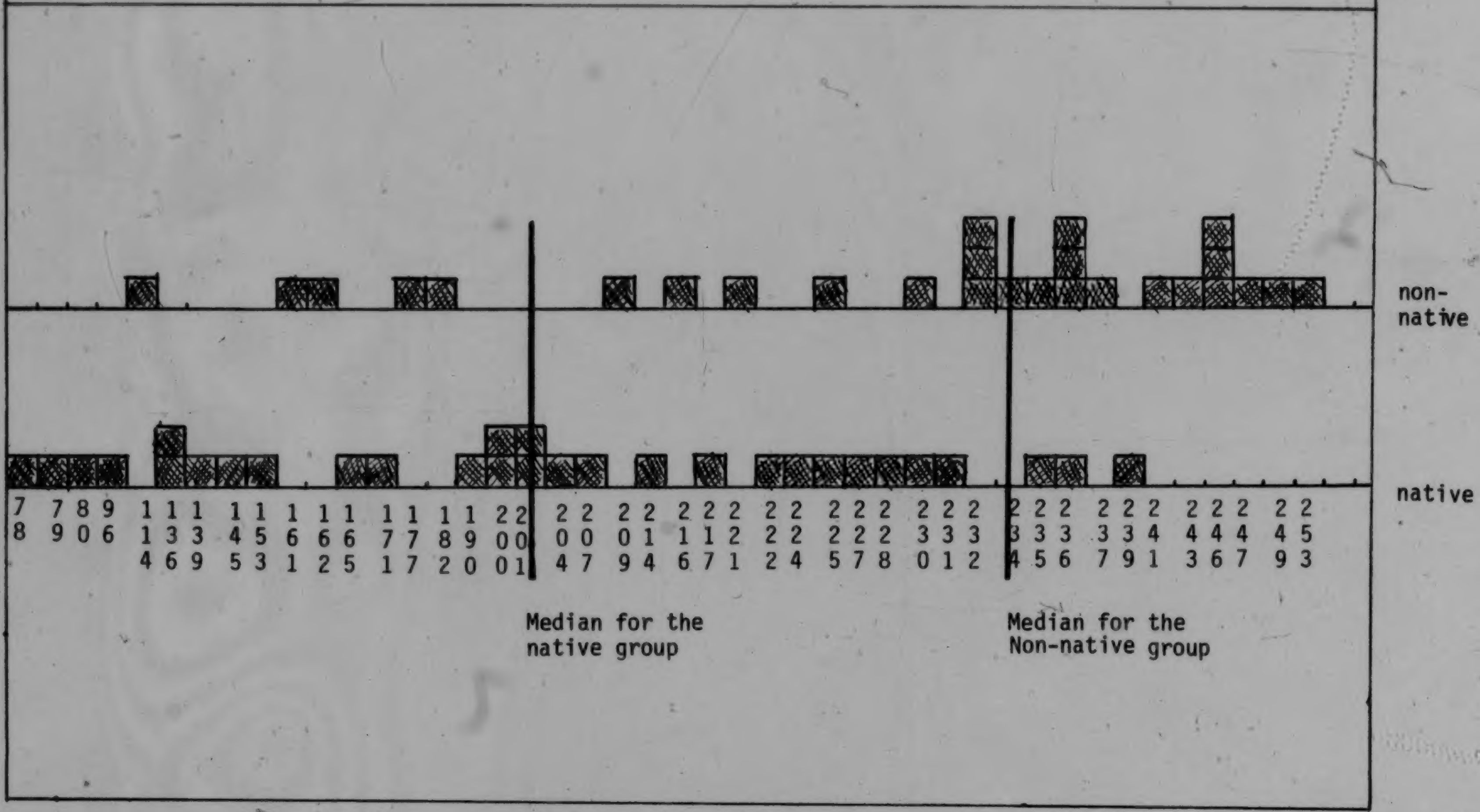
Comparative Performance of each Group on each Section of the Test

Unlike word pairs were then subdivided according to whether they were original Fast-Cosen Test items or items added by the present researcher. Comparative performance between the two groups on each subsection was examined. On each part of the test, the native children did not perform as well as the non-native at the .01 level of

Graph II Distribution of Scores on Like Word Pairs



Graph III Distribution of Scores on Unlike Word Pairs



significance (Table IV). It had been expected that the native children would have fared comparatively poorer on the section that included the added items, as they were based on points of contrast between the Cree and English phonemic systems as well as on errors Soveran (n.d.) had isolated for children of Cree background in the pronunciation and spelling of English.

Table VI

a) The Fast-Cosens Auditory Discrimination Test and
b) the Added Items Section: t-test summary between groups

Variable	Mean		df	t	P
	Native	Non-native			
a) Fast-Cosens Auditory Discrimination Test	97.133	115.44	55	-3.11	.01
b) Added items section	86.33	105.40	55	-3.2	.01

Comparison of Subsections of the Test Within Groups

In comparing the performance of the native group on each part of the test, it was found that they did significantly better on the original items than on the added ones at the .05 level (Table VII). The comparative difference for the white sample was not significant.

Performance of the Two Test Populations on Phonological Categories (Table VIII and Graph IV)

The total test scores for both groups were analyzed in several ways to determine problem areas in discrimination. The first consideration was phonological types. Unlike word pairs were assigned to appropriate categories according to the phonemic contrast in the minimal pair. Following are the phonological categories used:

Table VII

The Fast-Cosens Auditory Discrimination Test verus
the Added Items Section: t-test summary within groups

Variable	Mean		df		t		P	
	Native	Non-native	Native	Non-native	Native	Non-native	Native	Non-native
The Fast-Cosens Auditory Discrimination Test	97.133	115.44	29	26	+2.69	1.58	.05	not significant
versus								
the Added Items Section	86.33	105.40						

1. Stops
2. Nasals
3. Semivowel:Lateral Comparisons
4. Fricatives
5. Affricate:Fricative Comparisons
6. Stop:Fricative Comparisons
7. Affricate:Stop-Fricative Comparisons
8. Affricates
9. ±Stops or Affricate after Sibilants and Nasals

Of course like pairs were not considered as it is impossible to know which were problem phonemes when incorrect answers had been given them.

A two-way analysis of variance was run on the phonological categories included on the total test. The A main effect indicates that on the overall test the native group made significantly more errors at the .01 level of significance. Graph IV indicates an essentially parallel performance across phonological types substantiated by the insignificant A-B interaction. Though the native children made more mistakes the relative performance on each phonological category generally follows the pattern of the non-native group. The category ±Stops or Affricate after Sibilants and Nasals has the greatest discrepancy between the two groups. As well the native sample had found this category to be the most difficult of all.

The essentially parallel nature of the results indicates that phonological type was a feature that had an effect for both groups in almost the same way. This would lend support to research that reports that certain phonological types are more difficult to discriminate on a universal basis (Carroll 1961).

Nasals were comparatively one of the most difficult categories for both groups to discriminate. Semivowel:Lateral Comparisons were the easiest for both groups. This phonological category was the least difficult as well for subjects of the Cosen's study (1968).

Table VIII

Phonological Categories - Summary of
two-way Analysis of Variance

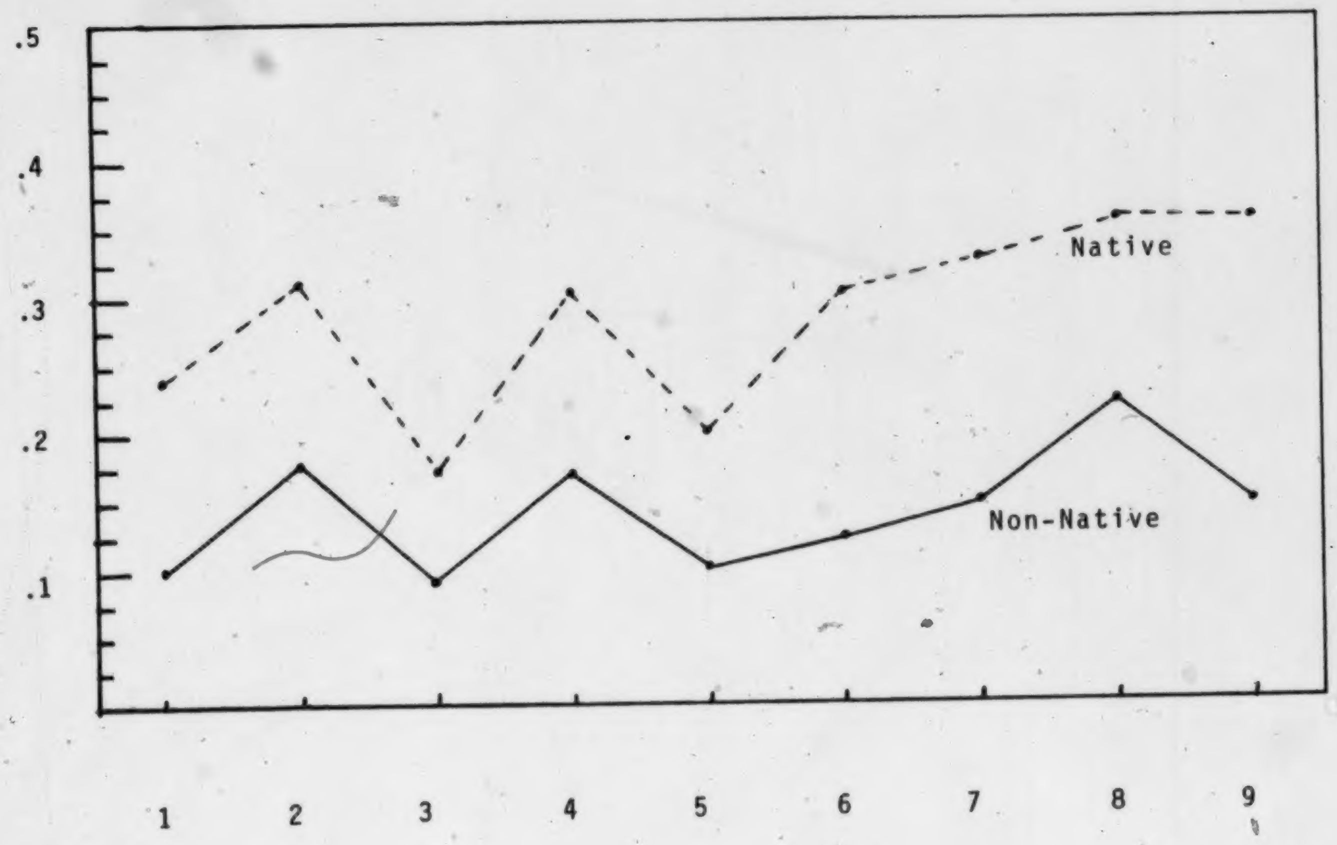
Source	df	MS	F	P.
A (groups)	1	2.654	9.533	0.003**
B (phonological categories)	8	0.151	11.602	0.0**
A-B (interaction)	8	0.024	1.813	0.07

Performance of the Two Test Populations on Position

The second area of consideration on the overall test was the position of comparison and its effect on each and both group's performance. Hence, unlike items were divided into initial, medial and final position categories depending upon where the comparison was made in the minimal pair. As this particular graph is a regrouping of the total test data, the fact remains that the natives performed significantly poorer as indicated by the A main effect. The B main effect indicates that the position of comparison did not have a significant effect on relative performance. The mean proportions for each position within each group are very close.

Templin (1957) had found the final position was the hardest for children in their articulation of sounds. The initial was the easiest for her subjects. Cosens (1968) discovered that the final position was the most difficult for auditory discrimination and the medial the easiest.

Graph IV Phonological Categories



1. Stops
2. Nasals
3. Semivowel:Lateral Comparisons
4. Fricatives
5. Affricate:Fricative Comparisons
6. Stop:Fricative Comparisons
7. Affricate:Stop-Fricative Comparisons
8. Affricatives
9. ± Stops or Affricate after Sibilants or Nasals

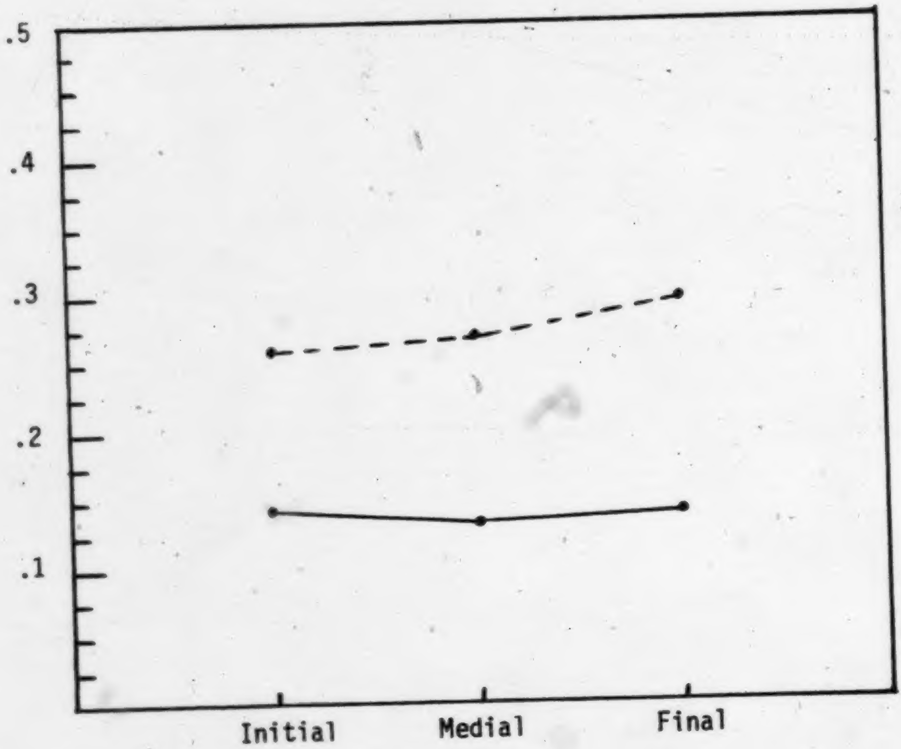
Table IX

Position - Summary of two-way analysis of variance

Source	df	MS	F	P
A (groups)	1	0.808	9.753	0.003**
B (position)	2	0.004	1.158	0.318
A-B (interaction)	2	0.006	1.829	0.165

Graph V

Position



Performance on the Two Test Populations on Voiceless, Voiced and Voiceless:Voiced Comparisons: (Table X and Graph VI)

Thirdly the test data was reorganized to consider three more categories dependent on the presence or absence of voicing. Minimal pairs were divided into groups depending on whether the comparisons were made between voiceless, voiced or voiced:and voiceless phonemes.

Again, this analysis merely regroups the total data and the A main effect has already been discussed. The interesting point is that the feature ± voicing has an effect as indicated by a significant B on both groups. In addition, voiced:voiceless comparisons within minimal pairs were almost as difficult as the voiced category for the non-natives and definitely more difficult than voiceless contrasts in minimal pairs for both groups. Cosens in her study had found a poorer performance on voiced contrasts than on voiceless ones.

An unexpected result is that the non-native children fared worse on the voiced:voiceless category than on the voiceless. It had been established from other research that the ±voicing contrast was easily discriminable for native speakers of English (Miller and Nicely 1961). As well, Templin had found no significant difference in ability to articulate voiced and voiceless phonemes (Cosens 1968).

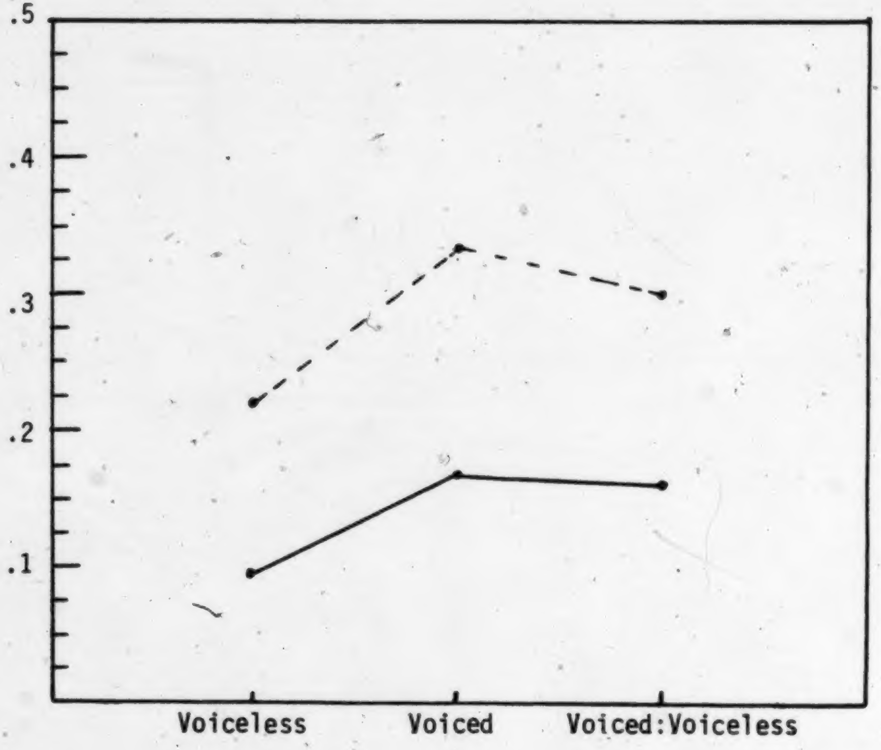
Table X

Voiceless, Voiced and Voiceless:Voiced Comparisons -
Summary of two-way analysis of variance

Source	df	MS	F	P
A (groups)	1	0.867	9.466	0.003 **
B (voiceless, voiced voiceless:voiced comparisons)	2	0.134	36.845	0.0 **
A-B (interaction)	2	0.007	1.882	0.157

Graph VI

Voiceless, Voiced and Voiceless:Voiced Comparisons



Section I

Phonological Categories and Subcategories

To obtain more specific information on potential areas of discrimination difficulty, each phonological category was further divided where possible into three sub-categories: (1) voiceless comparisons, (2) voiced comparisons, and (3) voiceless:voiced minimal pairs. Nasals were not subdivided as they are all voiced. Within those sub-categories having comparisons in one position, the two populations were compared on means of the incorrect number of items for each group using the t-test analysis. For each subcategory with two or three positions under consideration, a two-way analysis of variance was run. Since each position often did not have an equal number of items, mean proportions had to be determined for each position in order to make valid comparisons.

One Position Subcategories (Table XI and Graph VII)

For all but one instance the native children's performance was significantly lower on one-position phonological subcategories. Voiced affricate:voiced stop-fricative comparisons were not significantly difficult for them. However they experienced significantly greater difficulty on the other one-position subcategories at the .01 level.

Voiceless Stops (Table XII and Graph VIII)

On the subcategory, voiceless stops, the native children made significantly more errors than the non-native sample. The A-B interaction is significant at the .05 level. In comparing the distances between the two sets of means, it can be seen that voiceless stops in

Table XI

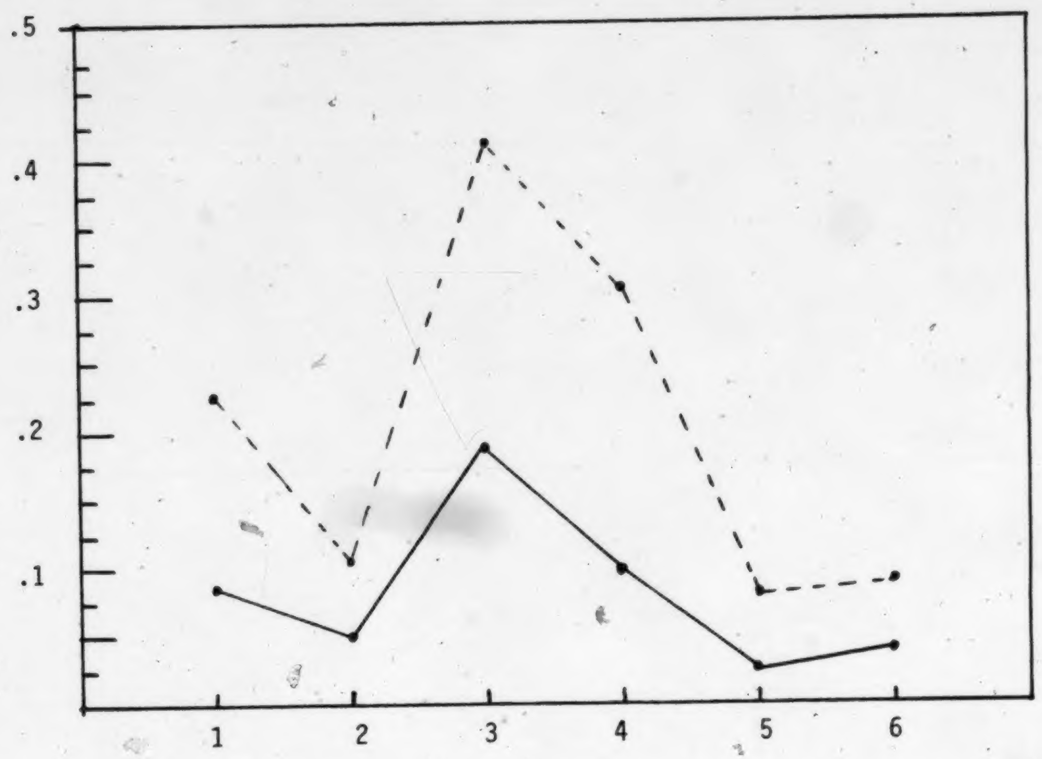
One-Position Phonological Subcategories: t-test

Summary Between Groups

Variable	Mean		df	t	P
	Native	Non-native			
Voiced-stops - final position	2.267	0.852	55	3.0582	.0034**
Voiceless Affricates: Voiceless Stop - Fricatives - final position	1.067	0.482	55	2.1744	.004 **
± Stops after Sibilants - final position	4.133	1.889	55	3.71	.0005**
± Stops or Affricate after Nasals - Final position	3.033	0.963	55	3.320	.0016 **
±h - initial position	.8	.259	55	2.858	.006**
Voiced Affricates: Voiced Stop - Fricatives - final position	.9	.407	55	1.888	.064

Graph VII

One-Position Phonological Subcategories



1. Voiced Stops - final position
2. Voiceless Affricates: Voiceless Stop-Fricatives-final position
3. ± Stops after Sibilants - final position
4. ± Stops or Affricate after Naslas - final position
5. ±h - initial position
6. Voiced Affricates: Voiced Stop-Fricatives-final position

final position were significantly more difficult for the native group than were comparisons made in the medial position.

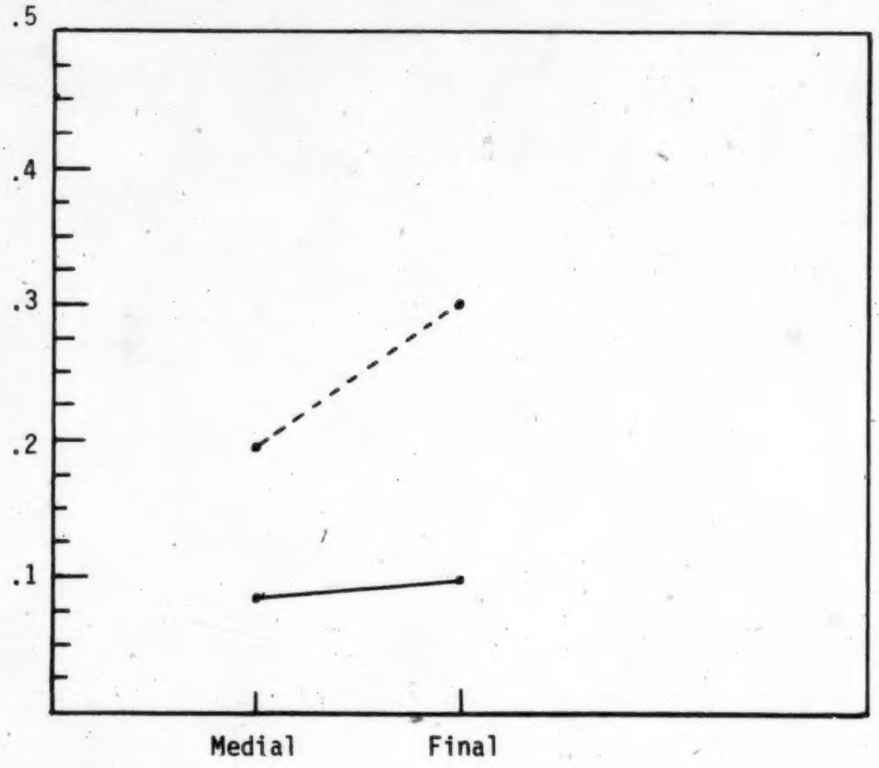
Table XII

Voiceless Stops - Summary of two-way analysis of variance

Source	df	MS	F	P
A (groups)	1	0.696	8.154	0.006 **
B (position)	1	0.105	7.128	0.010 **
A-B (interaction)	1	0.067	4.534	0.038 *

Graph VIII

Voiceless Stops



Nasals (Table XIII and Graph IX)

In examining the A main effect the native chilren's performance was significantly poorer when compared to the other group. The significant B main effect indicates that for both groups, position is an influencing factor; the medial position is more difficult than the final for both populations.

The A-B interaction is not significant.

Voiced Fricative:Voiced Affricate Comparisons (Table XIV and Graph X)

The A main effect indicates that this subcategory of comparisons was significantly more difficult for the native children. The A-B interaction is significant at the .0I level. The discrepancy in performance between the two groups is larger for comparisons made in final position than in medial indicating that the final position is much harder for the native group. In this case position does not have an overall influence on both groups.

Voiceless Stop:Voiced Stop Comparisons (Table XV and Graph XI)

According to the main effect, the native children made significantly more mistakes in this category of comparisons. However, the B main effect indicates that position is a significant influence for both groups. The medial position is more difficult than the other two. There is no significant A- B interaction.

Semivowel:Lateral Comparisons (Table XVI and Graph XII)

Though the native children made more errors for all positions the difference is not significant. The B main effect indicates that position has an influence on the scores of both groups. The initial position was the most difficult and the final position the least. There is no interaction in performance.

Table XIII

Nasals: Summary of two-way analysis of variance

Source	df	MS	F	P
A (groups)	1	0.532	7.079	0.010**
B (position)	1	0.155	7.361	0.009**
A-B (interaction)	1	0.001	0.034	0.855

Graph IX

Nasals

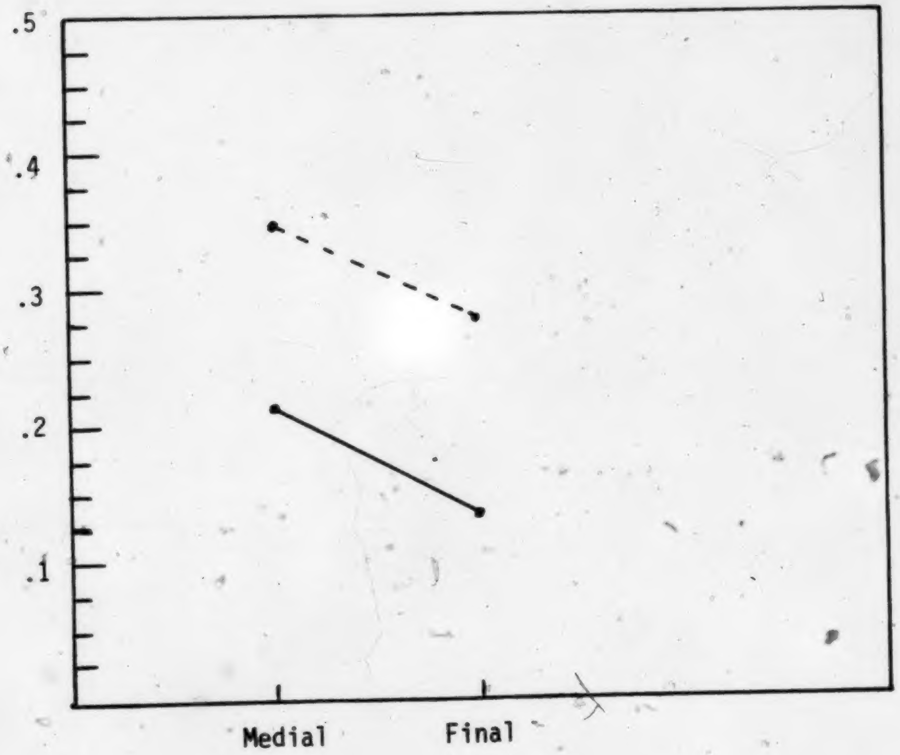


Table XIV

Voiced Fricative : Voiced Affricate Comparisons -

Summary of two-way analysis of variance

Source	df	MS	F	P
A (groups)	1	0.867	8.774	0.004 **
B (position)	1	0.046	1.242	0.270
A-B (interaction)	1	0.455	12.362	0.001 **

Graph X

Voiced Fricative:Voiced Affricative Comparisons

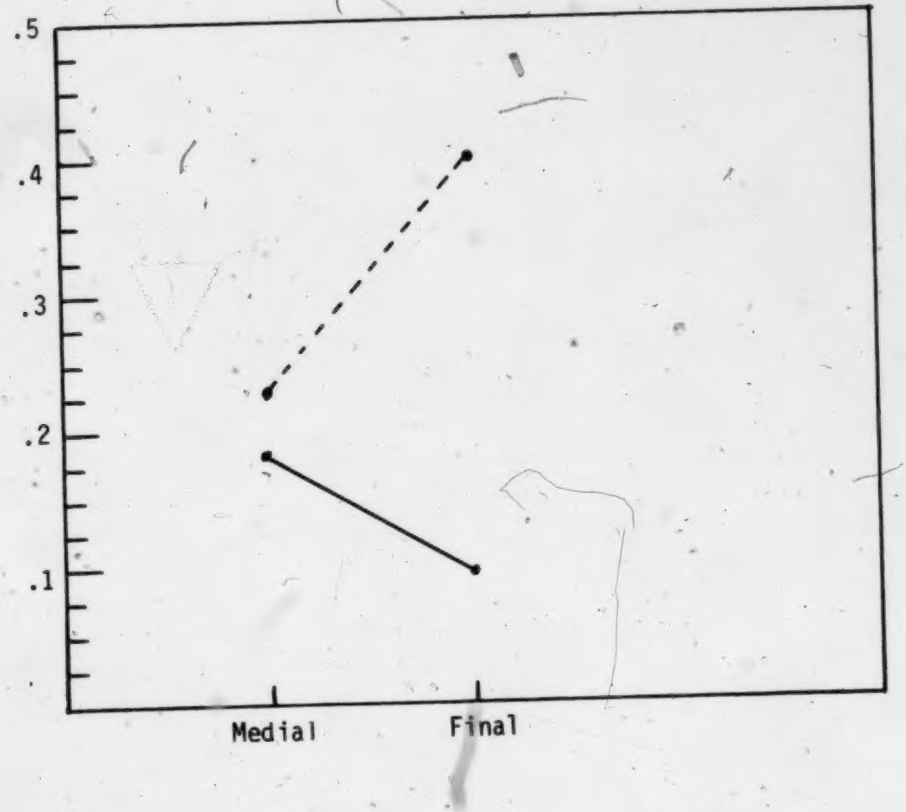


Table XV

Voiceless Stop:Voiced Stop Comparisons -

Summary of two-way analysis of variance

Source	df	MS	F	P
A (groups)	1	0.654	5.570	0.022*
B (position)	2	0.057	3.218	0.044*
A-B (interaction)	2	0.012	0.665	0.516

Graph XI

Voiceless Stop:Voiced Stop Comparisons

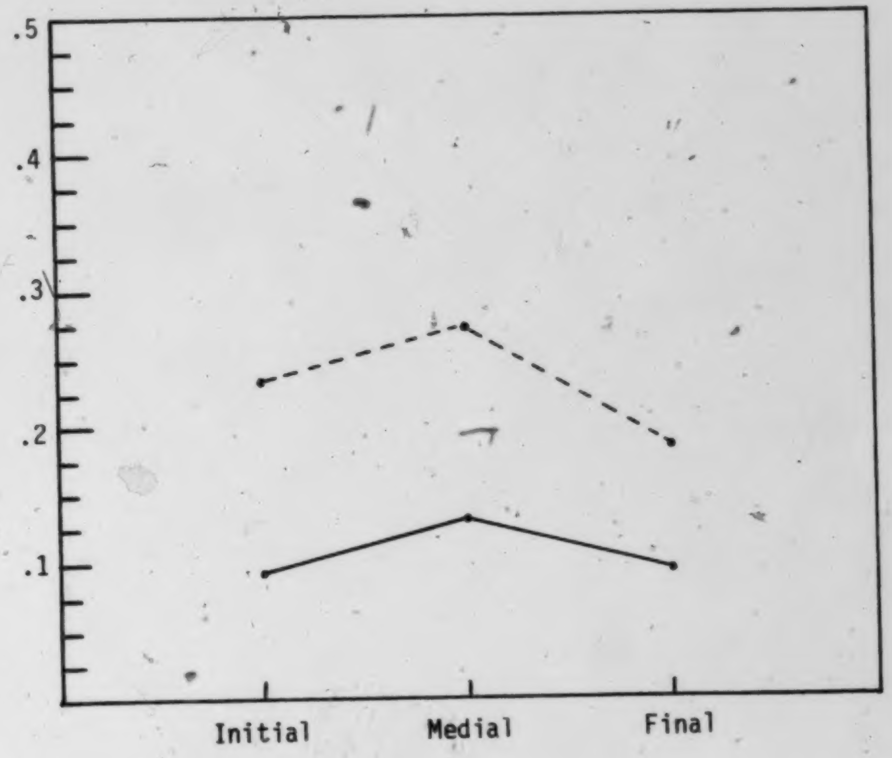


Table XVI

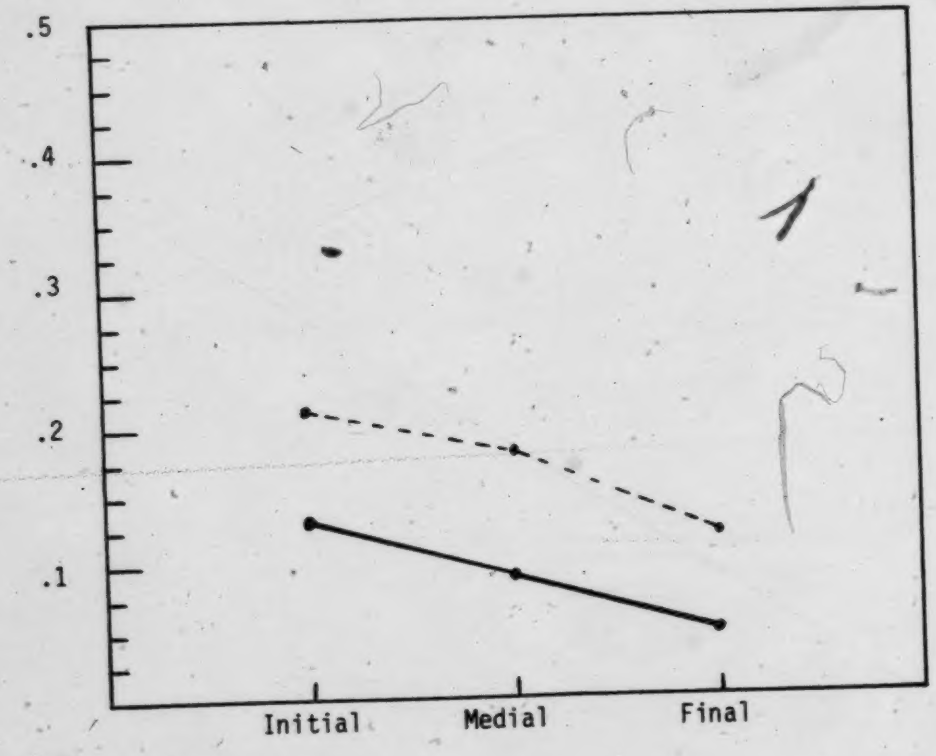
Semivowel:Lateral Comparisons -

Summary of two-way analysis of variance

Source	df	MS	F	P
A (group)	1	0.288	3.527	0.066
B (position)	2	0.110	3.080	0.049*
A-B (interaction)	2	0.001	0.032	0.968

Graph XII

Semivowel:Lateral Comparisons



Voiceless Fricatives (Table XVII and Graph XIII)

Again the non-natives made fewer discrimination errors for all three positions at a .01 level of significance. The parallel nature of the graph plus the significant B main effect reflects an effect of position, especially initial on the performance of both populations. It appears that this position is the most difficult for this subcategory.

Voiced Fricatives (Table XVIII and Graph XIV)

The data indicates that on the overall performance the native group scored significantly lower with more errors being made by them. However, there is an interesting and significant interaction effect. Both groups fared virtually the same for comparisons made in the initial position. However, a huge gap exists between the performance on medial minimal pairs. Similarly a gap though not as great, is present on final position comparisons.

The native group reflects an expected pattern from research with the final position being the most difficult. The white sample, however, found the final and initial positions equally difficult.

Voiceless Fricative:Voiced Fricative (Table XIX and Graph XV)

The native children's auditory discrimination of this category of sound comparisons is significantly poorer. The B main effect reflects that no one position was significantly more difficult than the others for both populations.

Table XVII

Voiceless Fricatives - Summary of two-way analysis of variance

Source	df	MS	F	P
A (groups)	1	0.581	7.388	0.009**
B (position)	2	0.444	33.184	0.0**
A-B (interaction)	2	0.003	0.215	0.807

Graph XIII

Voiceless Fricatives

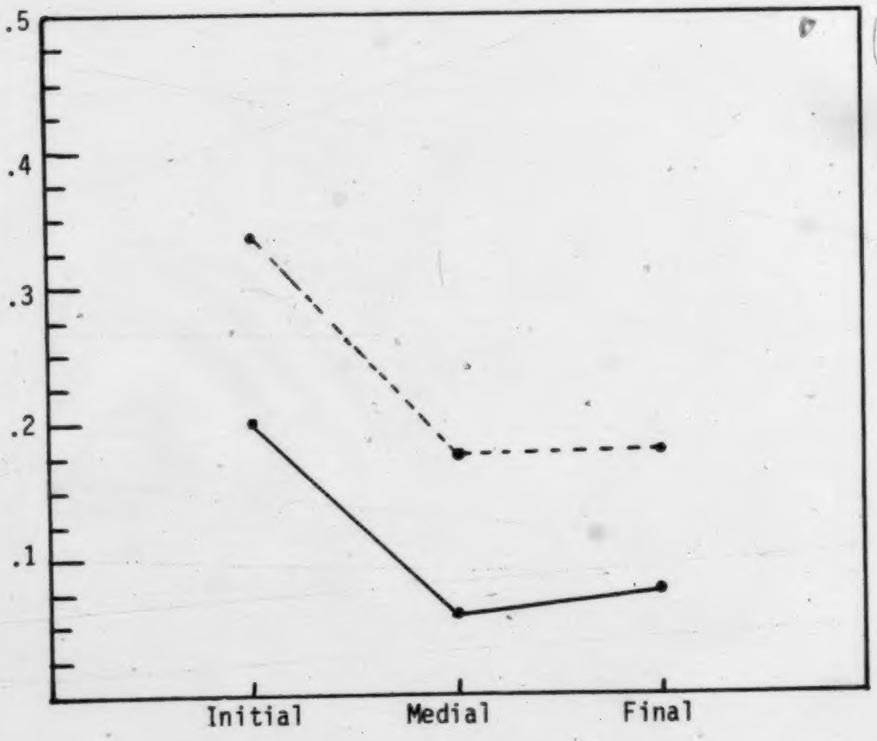


Table XVIII

Voiced Fricatives - Summary of two-way analysis of variance

Source	df	MS	F	P
A (groups)	1	0.697	6.646	0.013*
B (position)	2	0.492	13.071	0.0**
A-B (interaction)	2	0.231	6.140	0.003**

Graph XIV

Voiced Fricatives

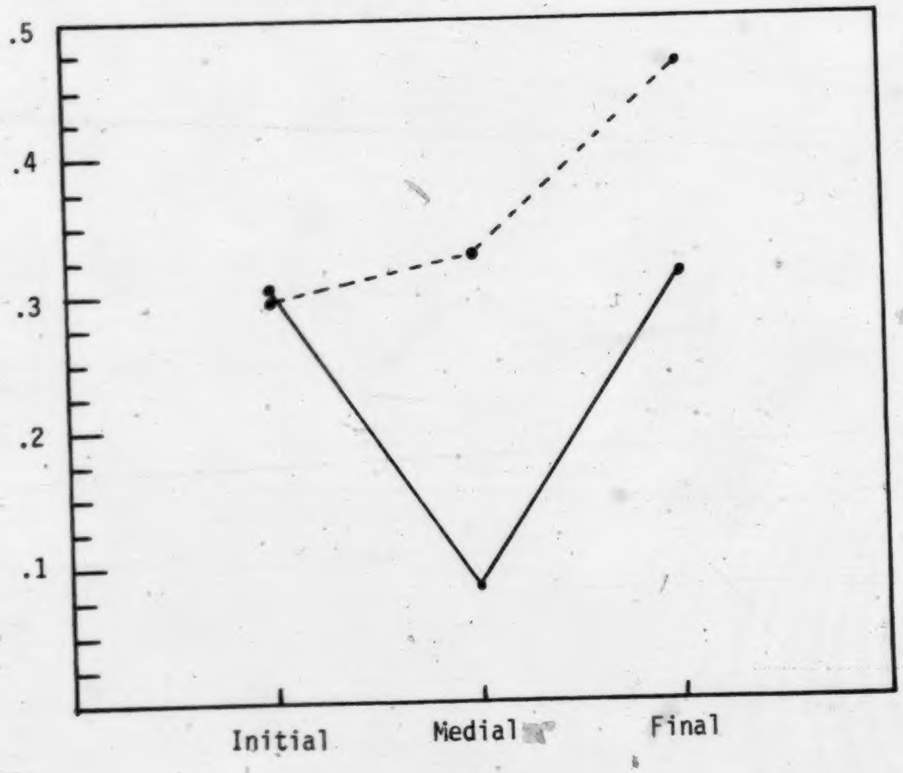


Table XIX

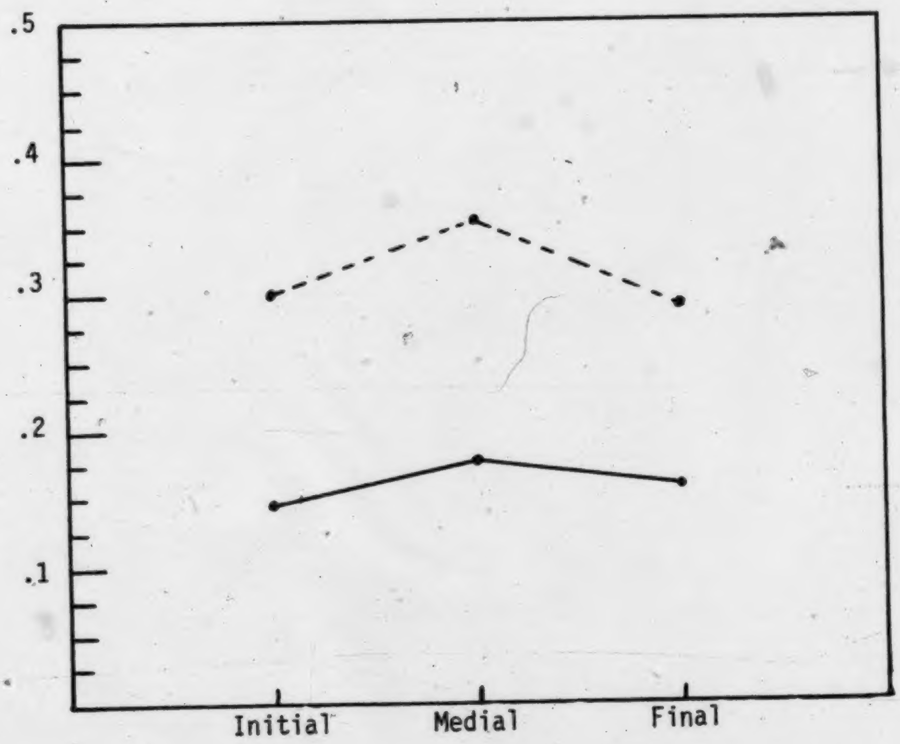
Voiceless Fricative:Voiced Fricative Comparisons

Summary of two-way analysis of variance

Source	df	MS	F	P
A (groups)	1	1.048	8.489	0.005**
B (position)	2	0.032	1.539	0.219
A-B (interaction)	2	0.006	0.308	0.735

Graph XV

Voiceless Fricative:Voiced Fricative Comparisons



Voiceless Affricate:Voiced Affricate Comparisons (Table XX and Graph XVI)

The non-native sample performed significantly better on this set of comparisons as indicated by the A main effect. The B main effect reveals that no one position is significantly more difficult than any other for both groups. As well the A-B interaction is insignificant.

Voiceless Fricative:Voiceless Affricate Comparisons (Table XXI and Graph XVII)

Though the graph indicates that the native children made more mistakes on all three positions, it is not a significant difference. Position does not have an overall significant influence on both populations. Nor is there an interaction effect indicating that one position is significantly more difficult than any other for the native, when compared to their non-native counterparts.

Voiceless Stop:Voiceless Fricative Comparisons (Table XXII and Graph XVIII)

On this overall category of comparisons, the natives did significantly poorer. The interaction effect is not significant despite the discrepancy for the final position being greater than for initial and medial between the two groups. Rather, the essentially parallel lines indicate that position has a significant influence on both groups' performance in this category. The final position is the most difficult for auditory discriminations to be made in, and the initial position is the least.

Table XX

Voiceless Affricate:Voiced Affricate Comparisons

Summary to two-way analysis of variance

Source	df	MS	F	P
A (groups)	1	0.758	4.561	0.037*
B (position)	2	0.003	0.055	0.947
A-B (interaction)	2	0.018	0.384	0.682

Graph XVI

Voiceless Affricate:Voiced Affricate Comparisons

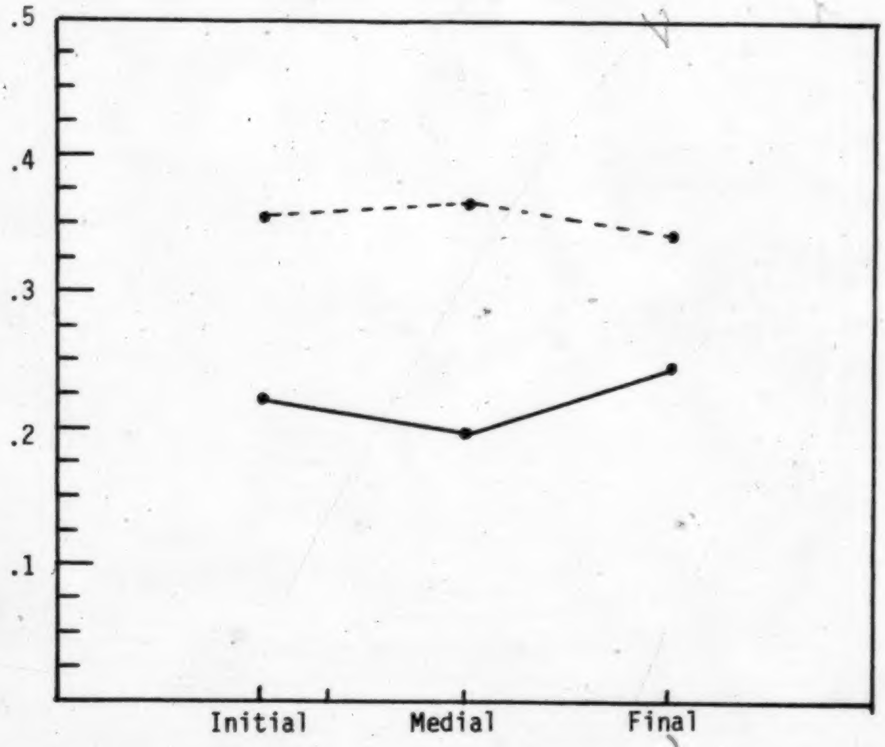


Table XXI

Voiceless Fricatve:Voiceless Affricate Comparisons

Summary of two-way analysis of variance

Source	df	MS	F	P
A (groups)	1	0.079	1.824	0.182
B (position)	2	0.056	1.992	0.141
A-B (interaction)	2	0.015	0.519	0.297

Graph XVII

Voiceless Fricative:Voiceless Affricate Comparisons

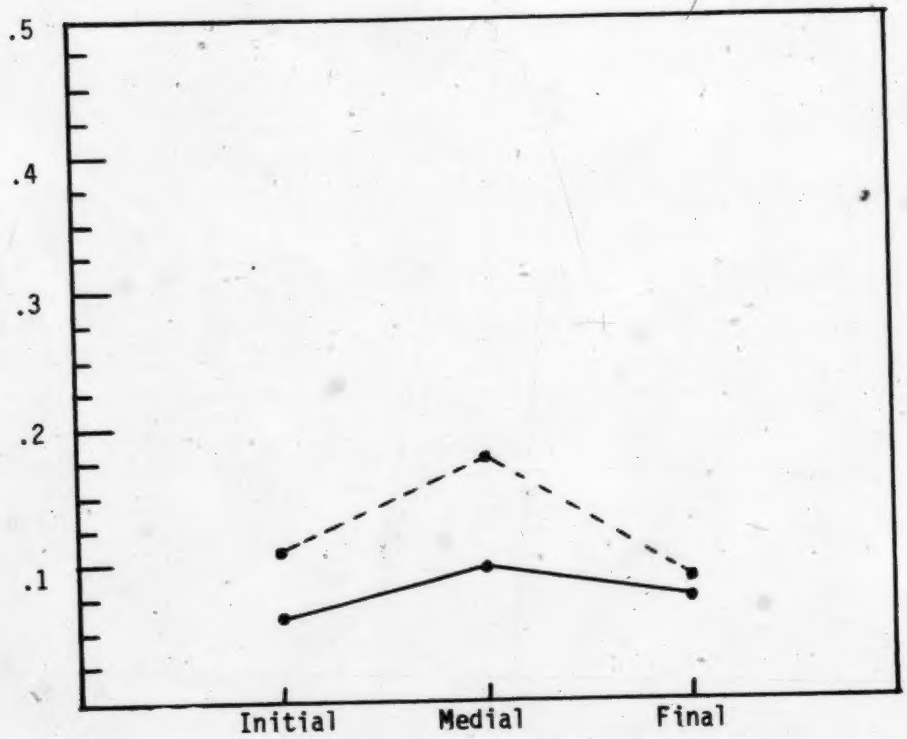


Table XXII

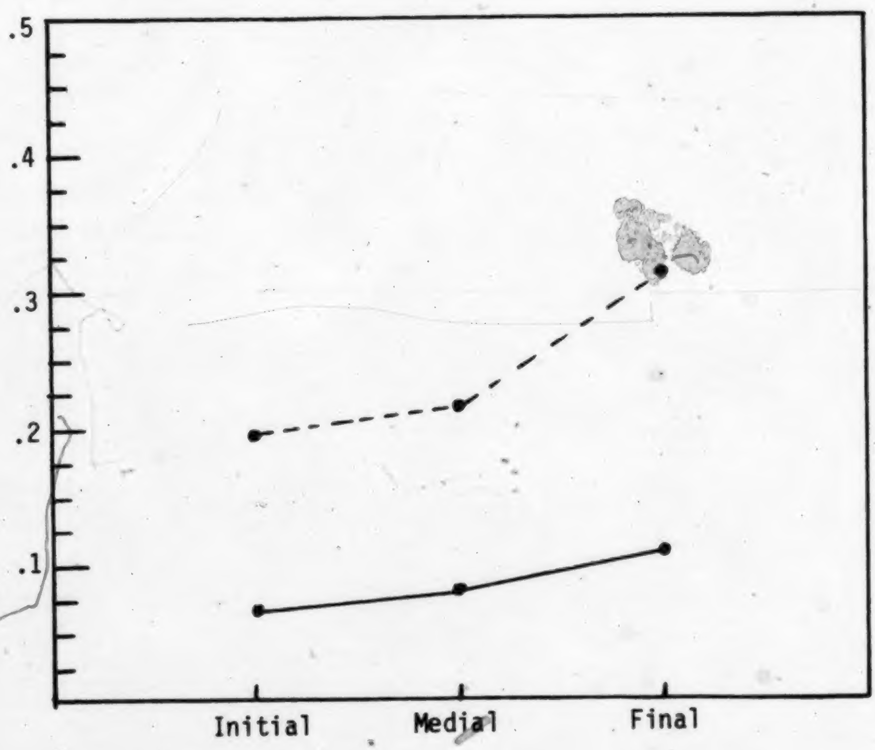
Voiceless Stop:Voiceless Fricative Comparisons

Summary of two-way analysis of variance

Source	df	MS	F	P
A (groups)	1	1.082	10.971	0.002**
b (position)	2	0.106	6.789	0.002**
A-B (interaction)	2	0.023	1.488	0.230

Graph XVIII

Voiceless Stop:Voiceless Fricative Comparisons



Voiced Stop:Voiced Fricative Comparisons (Table XXIII and Graph XIX)

The natives made significantly more errors at the .01 level. The B main effect is significant with the final position being the most difficult and initial the least. The A-B interaction is insignificant.

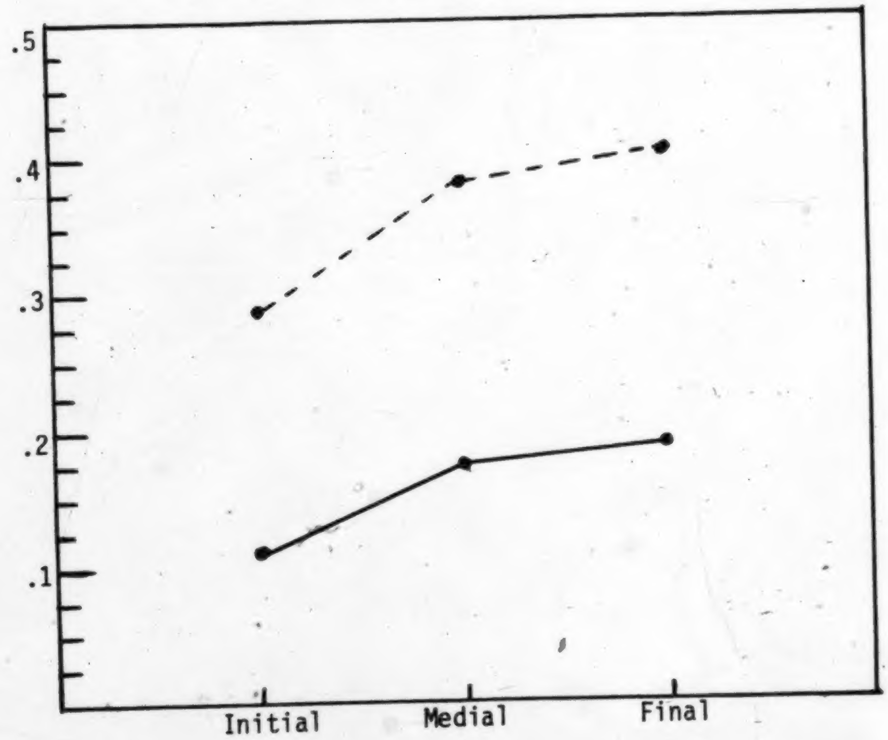
Table XXIII

Voiced Stop:Voiced Fricative Comparisons
Summary of two-way analysis of variance

Source	df	MS	F	P
A (groups)	1	1.766	16.213	0.0002**
B (position)	2	0.149	8.173	0.0005**
A-B (interaction)	2	0.008	0.417	0.660

Graph XIX

Voiced Stop:Voiced Fricative Comparisons



Section II

In this section each phonological category that included voiceless comparisons, voiced comparisons, and in some instances voiceless: voiced minimal pairs were treated on these cells to determine the effect of the bipolar feature ± voicing on the performance of the two categories.

Stops (Table XXIV and Graph XX)

Native children made significantly more errors on all minimal pairs with stop contrasts. Within each group there is approximately the same score for both voiced and voiceless comparisons. The discrepancy in performance on the voiced:voiceless items was slightly smaller than for the strictly voiced or voiceless categories. The difference was not significant. In her study Cosens (1968) had found the students performed significantly better on voiceless stops than on voiced ones.

Fricatives (Table XXV and Graph XXI)

The non-natives performed significantly better on this category. The essentially parallel lines reveal that both populations were affected in the same way by the voicing feature. Voiced comparisons were the most difficult, followed by the voiced:voiceless distinctions.

Cosens (1968) had found as well that voiced fricative comparisons were significantly more difficult than voiceless ones. However as she had not included voiceless:voiced comparisons in her study relative performance of her subjects on this cell is not available.

Affricate:Stop-Fricative Comparisons (Table XXVI and Graph XXII)

The native performance on this category was significantly lower at the .05 level. The B main effect is not significant.

Table XXIV

Stops: Summary of two-way analysis of variance

Source	df	MS	F	P
A (groups)	1	0.907	8.884	0.004**
B (bipolar feature ± voicing)	2	0.0	0.031	0.970
A-B (interaction)	2	0.005	0.596	0.553

Graph XX

Stops

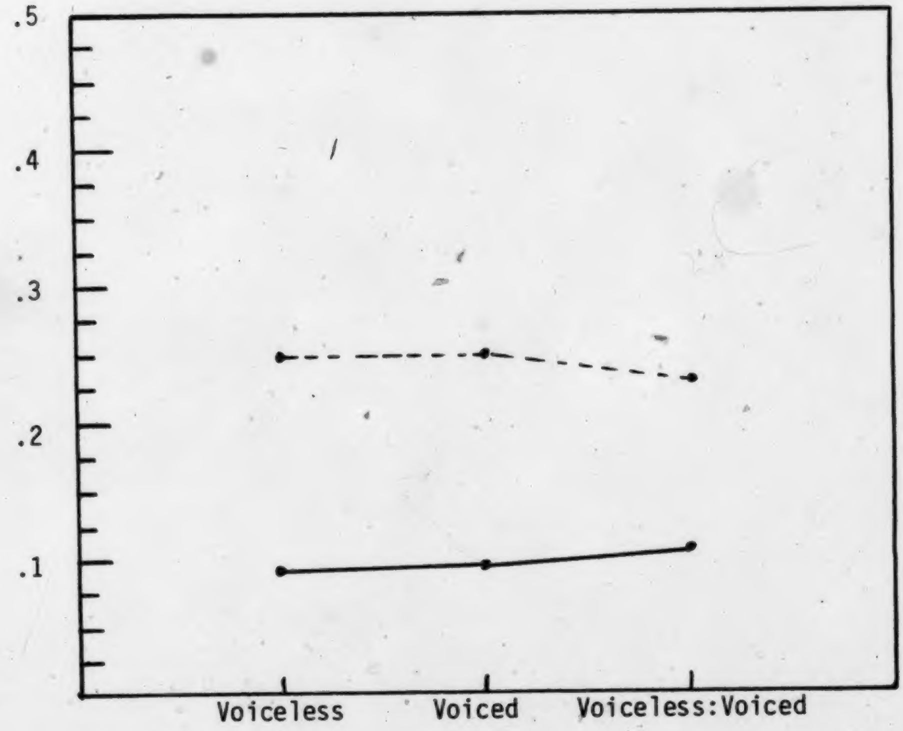


Table XXV

Fricatives - Summary of two-way analysis of variance

Source	df	MS	F	P
A (groups)	1	0.762	8.887	0.004**
B (bipolar feature ± voicing)	2	0.230	27.72	0.0*
A-B (interaction)	2	0.006	0.739	0.48

Graph XXI

Fricatives

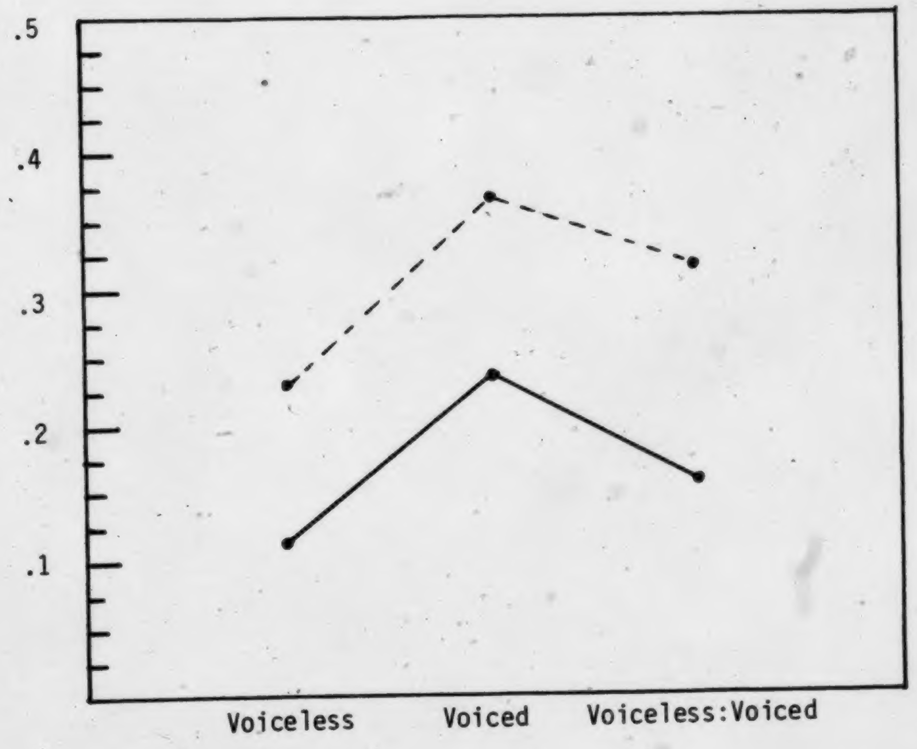


Table XXVI

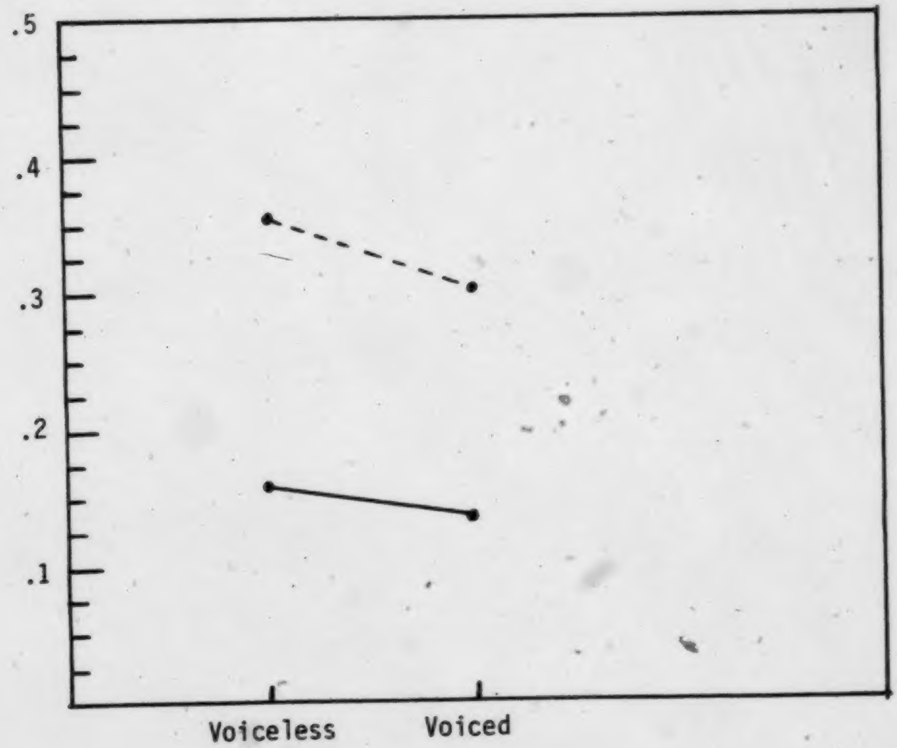
Affricate:Stop-Fricative Comparisons

Summary of two-way analysis of variance

Source	df	MS	F	P
A (groups)	1	0.917	4.457	0.039*
B (bipolar feature ± voicing)	1	0.046	2.831	0.098
A-B (interaction)	1	0.007	0.418	0.521

Graph XXII

Affricates:Stop-Fricative Comparisons



Stop:Fricatives Comparisons (Table XXVII and Graph XXIII)

The A main effect indicates that this category is significantly easier for the white population. Voiced contrasts in this case are definitely of greater difficulty for both groups as the B main effect shows. Cosens (1968) had found the same pattern but not of significant importance in her research.

Fricative:Affricate Comparisons (Table XXVIII and Graph XXIV)

This category was significantly easier for the non-natives. The voicing factor had a similar effect on both groups which confirms a pattern though not significant that Cosens (1968) had found in her research. As well, the ±-B interaction indicates that the voiced comparisons were significantly harder for the native group than were voiceless ones when being compared to the white sample.

Summary of Statistical Findings

Conclusions will be based on the acceptance or rejection of hypotheses outlined in Chapter one.

I. There will be no significant difference in performance between the native and non-native group.

a) On the overall Fast-Cosens Plus Auditory Discrimination Test
b) On the like word pairs
c) On the unlike word pairs
d) On the Fast-Cosens Auditory Discrimination Test itself
e) On the added items.

Table XXVII

Stop:Fricatives - Summary of two-way analysis of variance

Source	df	MS	F	P
A (groups)	1	0.936	14.496	0.0003 **
B (bipolar feature ± voicing)	1	0.244	53.383	0.0**
A-B (interaction)	1	0.014	3.026	0.088

Graph XXIII

Stop:Fricatives

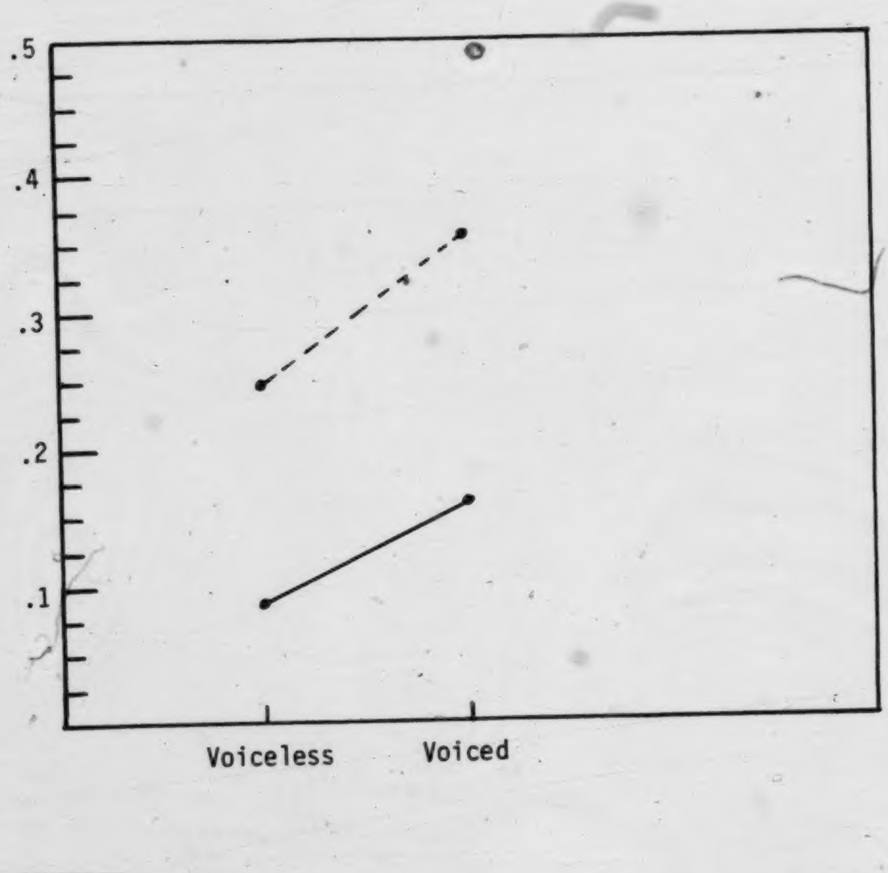


Table XXVIII

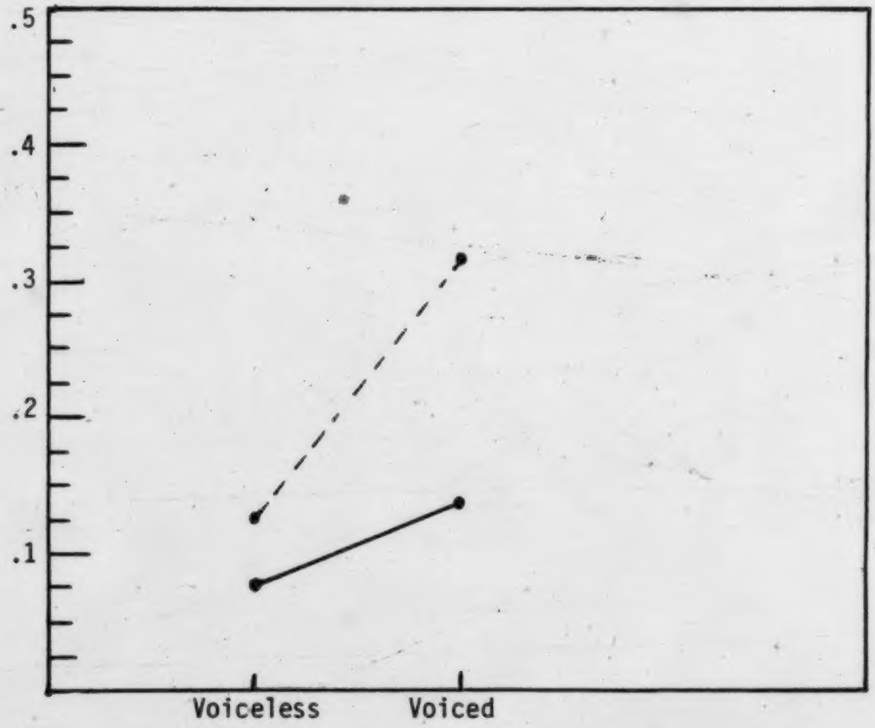
Fricative-Affricate Comparisons

Summary of two-way analysis of variance

Source	df	MS	F	P
A (groups)	1	0.351	7.074	0.01**
B (bipolar feature ± voicing)	1	0.459	26.245	0.0**
A-B (interaction)	1	0.114	6.526	0.013*

Graph XXIV

Fricative:Affricate Comparisons



a) Overall Performance on the Fast-Cosens Plus Auditory Discrimination Test

The native children fared very poorly on the total test in comparison to the other population. They made significantly more errors at the .01 level. Therefore this hypothesis was rejected.

b) Like Minimal Pairs

No significant difference in performance appeared between the two populations with respect to like word pairs: therefore this hypothesis was not rejected. It was concluded that neither population had any more difficulty than the other in hearing similarities in words.

c) Unlike Word Pairs

However on the minimal pairs the native group made more errors at the .01 level of significance. In rejecting this hypothesis, it was concluded that hearing the contrasted phonemes of minimal pairs was a more difficult task for the native group than for the non-native sample

d) The Fast-Cosens Auditory Discrimination Test, and e) Added Items Section

On both parts of the test, the white population did better at the .01 level of significance; thus these hypotheses were rejected. It would seem the overall task of auditory discrimination is a problem for the native group which could be attributed to the distinctly different language experiences each population has had before even reaching the school entrance age.

II. There will be no significant difference in performance of the native group on the Fast-Cosens Test as compared to the Added Items Section.

As already established, the native group did significantly poorer on the overall auditory discrimination test. In addition, when comparing the performance of this group on each section of the test, it was found that the added items were significantly more of a problem than the original ones for the native group. It would seem that compounding the effect of the overall language experience on auditory discrimination there is the expected influence of a second language. Therefore this hypothesis was rejected.

III. There will be no significant difference in performance of the non-native group on the Fast-Cosens Auditory Discrimination Test as compared to the Added Items Section.

Though the white children made more errors on the Added Items Section, the difference was not significant. Therefore this hypothesis was not rejected. A second language was not a compounding factor for the auditory discrimination of this group.

IV. In the analysis of a) the phonological types, b) position and c) the bipolar feature, voicing for the overall test there will be
(1) no significant difference in performance between the two groups on IVa, IVb, and IVc.
(ii) no significant pattern of relationships for both groups.
(iii) no significant interaction in the performance of the two groups.

a) Phonological Types:

Hypothesis IV(i) was rejected as there was a significant difference in performance for the two groups, favoring the non-native sample. This holds true for IVb and IVc as both groups were compared on the same overall data in both cases.

The essentially parallel performance of the two groups on this analysis as indicated by an insignificant A-B interaction but significant B main effect (.01) tends to lend support to a universal effect in the discrimination of phonological types. Certain phonological contrasts may be more difficult for children of any language background. On the basis of the statistical results, Hypothesis B(ii) was rejected and B(iii) was not rejected.

b) Position

An insignificant B main effect revealed that in this study no one position was more difficult than any other for both groups. Neither was there an interaction of performance scores. Both parts of this hypothesis were not rejected. This goes contrary to literature indicating comparisons in final position were the most difficult (Cosens 1968, Templin 1957).

c) ± Voicing

The presence or absence of voicing does have an overall effect on both groups. For the native group, the voiced:voiceless contrasts had been expected to be more difficult for them than the voiced or the voiceless minimal pairs. However for both groups voiced comparisons were the most difficult as Cosens (1968) had found in her research followed by the voiced-voiceless subsection. It is a surprise to find that the non-natives made more errors on the voiced:voiceless discrimination than on the voiceless ones. Miller and Nicely (1961) had considered ± voicing an easily discriminable feature.

VA. There will be no significant difference between the two groups in performance on one-position sounds.

As can be seen in Table XXIX all but one subcategory of comparisons were significantly more difficult for the native sample.

Table XXIX

One Position Phonological Subcategories	Significance
Voiced Stops - final position	.01
Voiceless Affricates:Voiceless Stop- Fricative Comparisons - final position	.01
± Stops after Sibilants - final position	.01
± Stops or Affricate after Nasals - final position	.01
±h - initial position	.01
Voiced Affricate:Voiced Stop-Fricative Comparisons - final position	---

VB. In the analysis of phonological categories and subcategories, there will be:

(i) no significant difference in performance between the two groups on each category and subcategory.

(ii) no significant pattern of relationships for both groups over the cells concerning position or over the cells concerning the bipolar feature ± voicing.

(iii) no significant interaction in the performance of the two groups.

For all subcategories but 1) semivowels and 2) voiceless fricative:Voiceless affricate comparisons in Section I and 3) Fricative: Affricate comparisons in Section II the native group made significantly more mistakes. Hypothesis VB(i) was rejected for all but these three instances. In Section I, position had a significant effect on both groups for 8 of the 12 subcategories. The final position was the most difficult for 4 cases, medial for 2 and initial for 2. Hypothesis VB(ii)

Table XXX

Summary of two-way analysis of variance for all Phonological Categories and Subcategories

	Phonological Category or Subcategory	A main effect	B main effect	A-B interaction	Most Difficult Cell
Section I	Voiceless Stops	.01	.01	.05	final
	Nasals	.01	.01	---	medial
	Voiced Fricative: Voiced Affricate Comparisons	.01	---	.01	
	Voiceless Stop: Voiced Stop Comparisons	.05	.05	---	medial
	Semivowel:Lateral Comparisons	---	.05	---	initial
	Voiceless Fricatives	.01	.01	---	initial
	Voiced Fricatives	.05	.01	.01	final
	Voiceless Fricative: Voiced Fricative Comparisons	.01	---	---	
	Voiceless Affricate: Voiced Affricate Comparisons	.05		---	final
	Voiceless Fricative: Voiceless Affricate Comparisons	---	---	---	
	Voiceless Stop: Voiceless Fricative Comparisons	.01	.01	---	final
	Voiced Stop:Voiced Fricative Comparisons	.01	.01	---	final
Section II	Stops	.01	---	---	
	Fricatives	.01	.01	---	voiced
	Affricate:Stop-Fricative Comparisons	.05	---	---	
	Stop:Fricative Comparisons	.01	.01	---	voiced
	Fricative:Affricate Comparisons	.01	.01	.01	voiced

was rejected for these 3 instances. It would seem that position in certain subcategories had an overall influence on both groups and is therefore possibly cross-cultural in its effect, a factor that may be of interest in further studies.

In Section II concerning ± voicing, three of the five subcategories showed a significant pattern of relationships. In all three, voiced comparisons were the most difficult. Hypotheses 5B(i) was rejected for these three subcategories.

There was one significant A-B interactions for Subsection II. Hypothesis 5B(iii) was not rejected for all but the one instance.

Performance on Specific Phonemic Contrasts

The following tables list the phonemic comparisons made in each category. As well they provide the percentage of students in each group that had all examples of a particular comparison correct. A percentage was used as the number subjects in each group is not equal. The final column indicates how many times larger the percentage for the non-native sample was in comparison with the native one for each phonemic contrast. The information obtained from these tables cannot be treated statistically but patterns or tendencies of particular interest can be isolated, examined and commented upon.

In order to isolate potentially interesting data the following criteria were established:

1. Items where less than 50% of the members of each group failed to discriminate all comparisons of a particular contrast correctly were examined (indicated by **).

2. Items where the percentage for the non-native group was 1.7 times or more greater than the native one were examined as well (indicated

by *).

According to the criteria the following phonemic examples were found.

2

Voiceless Stops

In the subcategory an especially difficult comparison was that of /p:t/ in final position.

Table XXXI

Voiceless Stops

Voiceless Stops	% of Native	% of Non-native	Times Greater
/-p-/:/-t-/	56.6	77.7	1.37
/-p/:/-t/	36.6	81.0	2.21*
/-t-/:/-k-/	53.3	77.7	1.45
/-t/:/-k/	50.0	77.7	1.55
/-p/:/-k/	50.0	74.0	1.48

Voiced Stops

The problem contrast /-b/:/-d/ in this subcategory is the voiced counterpart of the contrast discussed under voiceless stops. The native group found these two phonemic contrasts relatively more difficult, possibly because both sounds are articulated near the front of the mouth and the comparisons are made in final position.

Voiceless Stop:Voiced Stop Comparisons

Despite this being an added section to the test and despite the poorer performance of the native sample on each set of contrasts, no phonemic contrast meets the criteria established.

Table XXXII

Voiced Stops

Voiced Stops	% of Native	% of Non-native	Times Greater
/-g/:/-d/	53.5	81.0	1.51
/-d/:/-b/	50.0	88.8	1.776*
/-g/:/-b/	40.0	66.6	1.665

Table XXXIII

Voiceless Stop:Voiced Stop Comparisons

Voiceless Stop:Voiced Stop Comparisons	% of Native	% of Non-native	Times Greater
/p-/:/b-/	63.6	85.2	1.34
/-p-/:/-b-/	40.0	62.9	1.57
/-p/:/-b/	53.5	70.3	1.31
/t-/:/d-/	63.3	92.6	1.46
/-t-/:/-d-/	63.3	70.3	1.11
/-t/:/-d/	66.6	74.0	1.11
/g-/:/k-/	36.6	59.2	1.6
/-g-/:/-k-/	66.6	88.8	1.33
/-g/:/-k/	70.0	88.8	1.26

Nasals

The contrast /-n-/:/-ŋ-/ was particularly difficult for both but especially so for the non-natives. In her thesis study Cosens (1968) found that only 35.28% of her subjects had mastered this contrast. For /n:ŋ/ in final position the percentage of white children who could handle this contrast was more than double the percentage of native children. Similarly the discrimination of /-m-/:/-ŋ-/ by the Metis was poor.

Table XXXIV

Nasals

Nasals	% of Natives	% of Non-natives	Times Greater
/-n-/:/-ŋ-/	50.0	40.7	.814
/-n/:/-ŋ/	26.6	55.5	2.08*
/-m-/:/-ŋ-/	33.3	59.2	1.77*
/-m/:/-ŋ/	56.6	74.0	1.3

Semivowel:Lateral Comparisons

No items met the criteria in this category. Both groups had found this set of comparisons the easiest to discriminate of all categories tested.

Voiceless Fricatives

No native child and only two of the twenty-seven white subjects mastered the /θ-/:/f-/ minimal pairs. In Cosen's study (1968) only 9.24% of the sample mastered this set of minimal pairs. A possible reason is that the listener relies on visual cues for discriminating

Table XXXV

Semivowel:Lateral Comparisons

Semivowel:Lateral Comparisons	% of Native	% of Non-native	Times Greater
/r-/:/l-/	66.6	70.3	1.05
/-r-/:/-l-/	70.0	85.2	1.21
/-r/:/-l/	66.6	85.2	1.27
/w-/:/l-/	56.5	66.6	1.33
/w-/:/r-/	50.0	74.0	1.48

Table XXXVI

Voiceless Fricatives

Voiceless Fricatives	% of Native	% of Non-native	Times Greater
/θ-/:/f-/	0.0	7.4	
/s-/:/θ-/	50.0	70.3	1.4
/-θ/:/-s/	43.4	74.0	1.7*
/-s-/:/-f-/	70.0	77.7	1.11
/-s/:/-f/	70.0	88.8	1.27
/š-/:/s-/	50.0	81.0	1.62
/-š-/:/-s-/	63.6	88.8	1.40
/-š/:/-s/	56.5	88.8	1.57
/š-/:/θ-/	66.6	85.2	1.28
/-š/:/-θ/	63.6	92.6	1.45
/-š-/:/-f-/	76.6	92.6	1.2
/-š/:/-f/	70.0	88.8	1.27

sounds articulated near the front of the mouth, which a tape such as the one used in the study does not provide (Cosens 1968). Miller and Nicely (1961) as well as Fast (1968) had found this particular comparison especially difficult for discrimination. Apparently according to Sampson and Richards (1973) this phonemic contrast is difficult for individuals of any linguistic background.

/-θ/:/-s/ was particularly more difficult for the native than for the white sample. The comparison /s:š/ in all positions had been an anticipated difficulty. Although the native group made more mistakes on them than did the non-native, these phonemic contrasts did not meet the criteria.

Voiced Fricatives

Although the two comparisons /v-/:/ð-/ and /-v/:/-ð/ were difficult for both groups, they were more so for the non-native population. They comprise two of the three instances where the native children did better though only marginally so in each case. Again research, (Miller and Nicely 1961, Fast 1968, Sampson and Richards 1973) substantiate how hard this phonemic contrast is for children of English-speaking as well as non-English speaking background.

The native group fared poorly as well on /-z/:/-ð/ and /-z-/:/-ž-/ items. /-z-/:/-ž-/ minimal pairs are added items and the difficult bipolar feature, ± anteriority comes into play in the medial position for the native sample. The final comparison was difficult as well but did not meet the criteria established initially.

Table XXXVII
Voiced Fricatives

Voiced Fricatives	% of Native	% of Non-native	Times Greater
/v-/:/ð-/	40.0**	25.9**	.68
/-v/:/-ð/	13.3**	11.1**	.83
/-z-/:/-ð-/	43.3	77.7	1.79*
/-v-/:/-z-/	80.0	85.0	1.06
/-v/:/-z/	66.6	88.8	1.33
/-z-/:/-ž-/	30.0	88.8	2.96*
/-z/:/-ž/	50.0	77.7	1.55

Voiceless Fricative:Voiced Fricative Comparisons

Of this set of added items based on the bipolar feature, ± voicing, /-θ-/:/-ð-/ was difficult for both groups with less than one half of each population being able to distinguish all three examples.

Difficulty involving absence or presence of voicing was the most noticeable for the native population in all three comparisons, /θ-/:/ð-/, /-v-/:/-f-/ and /-s-/:/-z-/.

Voiceless Affricate:Voiced Affricate Comparisons

This category included added items only. Less than one half of both populations mastered /č-/:/ǰ-/. Despite that, the non-native percentage was still 2.45 times greater. The medial position comes close to the 1.7 mark in establishing special difficulties for the native students. It appears that this category was generally a problem for all three positions range below the 59% mark.

Table XXXVIII

Voiceless Fricative:Voiced Fricative Comparisons

Voiceless Fricative: Voiced Fricative Comparisons	% of Native	% of Non-native	Times Greater
/θ-/:/ð-/	43.3	85.0	1.96*
/-θ-/:/-ð-/	43.3	59.2	1.36
/-θ/:/-ð/	36.6	48.0	1.31
/f-/:/v-/	33.3	55.5	1.67
/-f-/:/-v-/	30.0	62.9	2.90*
/-f/:/-v/	40.0	59.2	1.48
/s-/:/z-/	56.5	70.3	1.24
/-s-/:/-z-/	30.0	59.2	1.97*
/-s/:/-z/	56.5	81.0	1.43

Table XXXIX

Voiceless Affricate:Voiced Affricate Comparisons

Voiceless Affricate: Voiced Affricate Comparisons	% of Native	% of Non-native	Times Greater
/č-/:/ǰ-/	16.6	40.7	2.45*
/-č-/:/-ǰ-/	36.6	59.2	1.62
/-č/:/-ǰ/	43.4	51.8	1.19

Voiceless Fricative:Voiceless Affricate Comparisons:

No comparisons in this category meet the criteria.

Table XL

Voiceless Fricative:Voiceless Affricate Comparisons

Voiceless Fricative: Voiceless Affricate Comparisons	% of Native	% of Non-native	Times Greater
/š-/:/č-/	70.0	85.0	1.21
/-š-/:/-č-/	63.3	77.7	1.23
/-š/:/-č/	73.3	77.7	1.06

Voiced Fricatives:Voiced Affricate Comparisons

/-ǰ/:/-ž/ comparisons were especially difficult for the native sample.

Voiceless Affricate:Voiceless Stop-Fricative Comparisons and Voiced Affricate:Voiced Stop-Fricative Comparisons

/-č/:/-ts/ was especially difficult for the native sample as anticipated. However the voiced counterparts do not meet the criteria.

Table XLI

Voiced Fricative:Voiced Affricate Comparisons

Voiced Affricate: Voiced Fricative Comparisons	% of Native	% of Non-native	Times Greater
/-z-/:/-ǰ-/	76.6	88.8	1.16
/-z/:/-ǰ/	30.0	77.7	2.59*
/-ǰ-/:/-z-/	50.0	51.5	1.04

Table XLII

Voiceless Affricate:Voiceless Stop-Fricative Comparison and Voiced Affricate:Voiced Stop-Fricative Comparisons

Voiceless Affricate: Voiceless Stop-Fricative Comparisons	% of Native	% of Non-native	Times Greater
/-č/:/-ts/	40.0	74.0	1.85*
Voiced Affricate: Voiced Stop-Fricative Comparisons	**% of Native**	**% of Non-native**	**Times Greater**
/-ǰ/:/-dz/	53.5	74.0	1.38

Voiceless Fricative:Voiceless Stop Comparisons

/-p/:/-f/ and /-θ/:/-t/ minimal pairs were especially difficult for the native group. Both /θ:t/ and /p:f/ were anticipated trouble spots for the native sample but only the final position of each met the criteria.

Voiced Fricative:Voiced Stop Comparisons

The items that meet the criteria in this case were anticipated to be problems for the native group. /v-/:/b-/ is definitely more difficult for them and this comparison in final position presents discrimination difficulty for both groups as 50% or less had all three comparisons correct.

/ð:d/ in all three positions was difficult for the native group and progressively so from initial to final position. This is the only phonemic contrast that was particularly troublesome for them in all three positions.

Table XLIII

Voiceless Fricative:Voiceless Stop Comparisons

Voiceless Fricative: Voiceless Stop Comparisons	% of Native	% of Non-native	Times Greater
/f-/:/p-/	60.0	85.2	1.42
/-f-/:/-p-/	63.3	85.2	1.35
/-f/:/-p/	43.3	77.7	1.79*
/θ-/:/p-/	66.6	81.0	1.22
/-θ/:/-p/	66.6	81.0	1.22
/θ-/:/t-/	53.5	88.8	1.66
/-θ-/:/-t-/	50.0	77.7	1.55
/-θ/:/-t/	30.0	66.6	2.22*

Table XLIV

Voiced Fricative:Voiced Stop Comparisons

Voiced Fricative: Voiced Stop Comparisons	% of Native	% of Non-native	Times Greater
/v-/:/b-/	33.3	66.6	2*
/-v-/:/-b-/	43.4	62.9	1.45
/-v/:/-b/	33.3**	48.0**	1.44
/-ð/:/d-/	40.0	74.0	1.85*
/-ð-/:/-d-/	16.6	62.9	3.78*
/-ð/:/-d/	10.0	66.6	6.66
/ð-/:/b-/	70.0	81.0	1.15
/-z/:/-d/	43.4	70.3	1.62

± Stops after Siblants

Less than one half of each population discriminated correctly all three examples of ±/t/ after s. Despite that, the white group had almost three times the number of native students. The fact that ±/t/ after /s/ and ±/t/ after /š/ meet the criteria so strongly may indicate that any final consonant clusters with /t/ at the end (including the [t⁻] allomorph) are also difficult for the natives. As well ±/p/ after /s/ meets the second criteria established.

Table XLV
Stops after Sibilants

	% of Native	% of Non-native	Times Greater
±/t/ after /s/	13.3	37.0	2.78*
±/t/ after /s/	30.0	66.6	2.22*
±/p/ after /s/	40.0	74.0	1.85*

± Stops or Affricate after Nasals

±/t/ after /n/ was the only one of these added items to meet the criteria substantiating the possibility of a general problem with consonant clusters ending in /t/.

±h in Initial Position

±/h/ in initial position was more difficult for the native group.

Table XLVI

± Stops or Affricate after Nasals

	% of Native	% of Non-native	Times Greater
±/k/ after /n/	60.0	81	1.35
±/t/ after /n/	36.6	81	2.2*
±/p/ after /m/	50.0	77.7	1.55
±/č/ after /n/	50.0	74.0	1.48

Table XLVII

±/h/ in Initial Position

	% of Native	% of Non-native	Times Greater
±h	40.0	85.2	2.13

Summary

Nineteen of the twenty-four instances where the percentage of the non-native sample was 1.7 or more times greater than that of the native group involved either added items or items presenting anticipated difficulty which had already been included on the original test. Thirteen of the twenty-four contrasts were made in final position, six in the medial and five in the initial. Most of the contrasts involved contrasts of sounds articulated in the front part of the mouth.

Of the eight instances where 50% or less of each population had mastered the comparison five were anticipated problems for the native group.

CHAPTER V

This final chapter will summarize the study and present the implications that have been drawn from the findings of the previous chapter. As well, recommendations for further research will be made.

Summary of the Study

The purpose of this study was to establish the effect of a second language influence on the perception of English phoneme sounds in an auditory discrimination test by first grade children. Thirty native children speaking a variety of English influenced by Cree and twenty-seven non-native students with no second language influence were selected. The subjects were tested on the Fast-Cosens Plus Auditory Discrimination Test, which consisted of the original Fast-Cosens Test together with addition items of anticipated difficulty for the native groups. The comparative performance of the two groups on the total test, and subsections of it was examined.

Conclusions Drawn From Results

On the basis of the overall test results the native group performed less well than their non-native counterparts. It seems from the test analysis that the overall poor showing of the Metis group was a result of more than just the influence of the second language. The findings point to a more extensive problem likely related to the very different language experience that the natives have in comparison to the non-natives. Firstly the majority of native children in this study have been exposed to an interlanguage model of English. In addition as discussed in Chapter II, the native element has a set of cultural attitudes and habits toward language usage that militates against full

English language proficiency. The previous oral English language experience of the native sample would likely not have been extensive or varied enough to afford ease of perception and distinction of English phoneme sounds during the auditory discrimination task (Deutsch 1964).

Nevertheless the second language influence reveals itself in the comparative performance of the native population or the Fast-Cosen items and added items. The native group made significantly more errors on the added section where items had been selected on the basis of anticipated difficult owing to the Cree language background.

The almost parallel performance of the two groups on most categories lends support to the idea that certain phonological contrasts and possibly even phoneme positions in the word itself are more difficult for children of any linguistic background. In the majority of phonological categories there is really not a difference in the performance of the natives except for the number of errors. Otherwise they seem to follow the same developmental pattern of the non-native. In these instances Cree is not the cause of errors. Further language experience for the native children would likely close the gap.

Implications for Education

Background research indicates that many native children have a deficit English competency which can adversely affect their academic achievement. This language experience, compounded by the influence of Cree, has been shown to affect significantly children's auditory discrimination ability of English phoneme sounds. For this reason the following implications from the study are thought to be important.

1. For these children to attain full competency functionally, .. semantically, syntactically and phonologically in Standard English would necessitate that carefully designed and researched oral English programs be introduced to them in elementary school to ensure development of proficiency in these dimensions.

2. Teachers must be made more aware of the effect of another language on a child's performance in English as he enters Grade one and how they can adapt their curriculum for the child's academic progress and benefit. More specifically with respect to auditory discrimination, teachers in charge of phonics-based reading programs must ensure that these children are hearing and distinguishing the phonemic distinctions necessary for sound-symbol associations in order to facilitate reading success.

Suggestions for Further Research

Considerable research has accumulated favoring the use of the native language in education where it is still being actively used in Metis and Indian communities. However there are many native settings where English has extensively encroached upon the use of the native tongue, usurping the integral role in communication that the first language had played. In these instances, the children often have limited fluency in either English or the native language. The English, that the children have upon school entrance, is inadequate to cope with the demands of the standard curriculum. In order to aid these children towards academic success research needs to be done in the following areas.

1. Full descriptions of native-tongue-English Interlanguage phenomena must be made in the functional, semantic, syntactic and

phonological dimensions in order that the nature of the interlanguage a native child brings to school can be understood.

2. Research needs to be done to determine the exact point at which possession of a second language hinders future development in reading in English.

3. Long-range research needs to determine whether this condition solves itself in time, with or without special oral English programs.

4. Further research on auditory discrimination in other interlanguage communities could be done to determine any potentially interesting patterns from the overall research.

Concluding Statement

This study has shown that the native population's performance was significantly poorer than the non-natives' on an auditory-discrimination test. The language experience of the native element as dictated by a limited English interlanguage model, and cultural habits and attitudes has been pinpointed as having a profound influence on auditory discrimination ability compounded by the second language influence.

Bibliography

Bibliography

Barber, L. Indians and Education. The School Trustee, 29(1) (February 1976), 6-11.

Bernstein, B. Class, Codes and Control Volume 1. Theoretical Studies Towards A Sociology of Language. London: Routledge and K. Paul, 1976.

Betts, E. Reading: Linguistics. Education, 83 (May 1963), 515-525.

Blossom, Grace. The Reading Problems of the Bilingual Child. Reading Improvement, 7 (Spring 1970), 20-22.

Bond, G.L. The Auditory and Speech Characteristics of Poor Readers. New York: Teacher's College. Columbia University, 1935.

Bowd, A.D. Some Determinants of School Achievement in Several Indian Groups. Alberta Journal of Educational Research, 18 (June 1972), 69-76.

Cairns, H. An Analysis of the Substitution Errors of a Group of Standard English-Speaking Children. Journal of Speech and Hearing Research, 15 (1972), 811-820.

Carroll, J.B. Language Acquisition, Bilingualism and Language Change, in Sol Saporta, ed. Psycholinguistics: A Book of Languages. Holt, Rinehart, and Winston, Toronto 1961, 331-345.

Clark, A. and Richards, C. Auditory Discrimination among Economically Disadvantaged and Nondisadvantaged Preschool Children, Exceptional Children, 33 (December 1966), 259-262.

Collier, John Jr. Alaskan Eskimo Education. New York: Holt, Rinehart and Winston, 1973.

Coombs, L. Madison. A Summary of Pertinent Research in Bilingual Education in Indian Education. Curriculum Bulletin No. 3, Washington, D.C.: Office of Educational Programs, United States Bureau of Indian Affairs, 1971, ED 061 789.

Cosens, G. An Experimental Study of the Effect of Training in Auditory Discrimination on Reading Achievement in Grade One. Unpublished Master's thesis, University of Alberta, Edmonton, 1968.

Darnell, Regna. Linguistic Diversity in Canadian Society. Edmonton, Alberta, Linguistic Research Inc., 1971, 155-172.

Dechant, Emerald V. Improving the Technique of Reading. New Jersey: Prentice-Hall, Inc., 1964.

Deutsch, C.P. Auditory Discrimination and Learning Social Factors. Merrill-Palmer Quarterly of Behavior and Development, 10 (July 1964), 277-296.

Durrell, D.D. and H.A. Murphy. The Auditory Discrimination Factor in Reading Readiness and Reading Disability. Education, 73 (May 1953), 556-560.

Dykstra, G. Auditory Discrimination and Beginning Reading. Reading Research Quarterly, 1 (Spring 1966), 7-34.

Eagan, Sr. Ruth L. The Relationship between Auditory Discrimination and Auditory Memory Span in Children from Kindergarten to Grade Three. Unpublished Master's thesis, University of Alberta, Edmonton, 1970.

Ewers, D. Relations Between Auditory Abilities and Reading Abilities: A Problem in Psychometrics. Journal of Experimental Education, 18 (1950), 239-262.

Fast, Joan. The Effect of Socio-Economic Status on the Development of Auditory Discrimination as it Relates to Reading Achievement. Unpublished Master's thesis, University of Alberta, Edmonton, 1968.

Gavin, Sister Mary T. The Impact of Phonological Environment Upon Auditory Discrimination of Word-Pairs and its Relation to Reading. Unpublished Doctoral thesis, University of Alberta, Edmonton, 1972.

Graham, Dorothy M. A Comparison Between the Indian and non-Indian Children in Southern Saskatchewan Based on Listening Comprehension, Auditory Discrimination and I.Q. Unpublished Doctoral thesis, University of Northern Colorado, 1972.

Grescoe, P. A Nation's Disgrace. The Canadian, April 23, 1977.

Griese, Arnold A. Special Problems of Reading Comprehension in the Education of Eskimo and Indian Pupils. In Franklin Berry ed. The Collected Papers of the Northern Cross-Cultural Education Symposium. Fairbanks, Alaska: University of Alaska, 1974, 21-23 ED 094 917.

Gue, L. Value Orientations in an Indian Community. The Alberta Journal of Educational Research. Vol. XVII, No. 1 (March 1971), 19-32.

Hall, M.E. Auditory Factors in Functional Articulatory Speech Defects. Journal of Experimental Education, 7 (December 1938), 110-132.

Harris, I.J. Effective Teaching of Reading Instruction. New York: American Book Co. Inc., 1962.

Hawthorn, H.B. *A Survey of the Contemporary Indians of Canada*, Vol. 2. Ottawa: Indian Affairs Branch, 1967.

Kirkness, V.J. Education of Indian and Metis, ed. D. Sealy and V.J. Kirkness. *Indians Without Tipis*. Winnipeg: William Clarke Ltd., 1973.

Kjolseth, Rolf. Bilingual Education Programs in the United States: For Assimilation or Pluralism? in Paul R. Turner, ed., *Bilingualism in the Southwest*. Tucson, Arizona: University of Arizona Press, 1973, 3-27.

Knachman, Barbara and Barbara Doak. Needs and Resources, in Franklin Berry, ed. *The Collected Papers of the Northern Cross-Cultural Educational Symposium*. Fairbanks, Alaska: University of Alaska, 1974, 79-85. ED 094 917.

Ledgerwood, C.D. *Native Education in the Province of Alberta*. Report of the Task Force on Intercultural Education. Edmonton, Alberta: Department of Education, Province of Alberta, 1972.

MacArthur, R. Ecology, Culture and Cognitive Development: Canadian Native Youth in S. Schluderman, Chm. Psychological Development of the Ethnic Child and Adolescent Symposium presented at the meeting of Canadian Ethnic Studies Assoc., Winnipeg, 1975.

McArthur, R. Assessing Intellectual Potential of Native Canadian Pupils: A Summary. *Alberta Journal of Educational Research*, Vol. *XIV*, No. 2, June, 1968, 37-41.

Miller, G.A. and P.E. Nicely. An Analysis of Perceptual Confusions among Some English Consonants in Sol Saporta, ed. *Psycholinguistics: A Book of Readings*. New York: Holt, Rinehart and Winston, 1966, 153-175.

Moffatt, Joha G. The Ability of Kindergarten Children to Discriminate Selected Vowel and Semivowel Speech Sounds. Unpublished Master's thesis, University of Alberta, Edmonton, 19720.

Mortenson, W.P. Differences in Performance of Beginning First Grade Pupils on Selected Economic Status and Sex. Dissertation Abstracts, 28 (August 1967), 547-548.

Newby, H.A. *Audiology*. New York: Appleton-Century-Crofts Inc., 1958, 31-45.

Oberg, A. Auditory Discrimination Ability of Children in Kindergarten, Grades One, Two and Three. Unpublished Master's thesis, University of Alberta, Edmonton.

Ohannessian, Sirarpi. The Language Problems of American Indian Children in Bernard Spolsky, ed. *The Language Education of Minority Children*. Rowley, Massachusetts: Newbury House, 1972, 13-24.

Payne, P.A. Qualitative Meaning in Vocabulary. Unpublished Master's thesis, University of Alberta, Edmonton, 1972.

Phillips, Susan. Acquisition Rules for Appropriate Speech Usage. In J. Alatis (ed.) Georgetown Monograph Series on Language and Linguistics (No. 23), 79-101.

Phillion, William and Charles Galloway. Indian Children and the Reading Program. Journal of Reading, XII (April 1969), 553-60, 598-602.

Poling, D.L. Auditory Deficiencies of Poor Readers. Clinical Studies in Reading II, 107-111. Supplementary Educational Monographs. No. 77. Chicago: University of Chicago Press, 1953.

Raph, J.B. Language Development in Socially Disadvantaged Children. Review of Educational Research, Vol. 35 (1965), 389-400.

Reid, R.L. Auditory Aspects of Reading Readiness. Unpublished Master's thesis, University of Alberta, Edmonton, 1962.

Richards, J. Social Factors, Interlanguage and Language Learning. Language Learning 22 (2) (1970), 159-188.

Sampson, G. and J. Richards. Learner Language Systems. Language Sciences (August 1973), 18-24.

Soveran, M. From Cree to English. University of Saskatchewan, Indian and Northern Curriculum Resources Centre (n.d.).

Templin, M.C. Certain Language Skills in Children: Their Development and Interrelationships. Institute of Child Welfare Monograph Series, No. 26, University of Minnesota Press, 1957.

Thompson, B.B. A Longitudinal Study of Auditory Discrimination. Journal of Education Research, 56 (March 1963), 376-378.

Tough, J. Children's Use of Language. Educational Review, 1973, 26 (3).

Ulibarri, Horacio. Bilingualism. In Emma B. Birkmaier, ed. Britannica Review of Foreign Language Education. Vol. 1, Chicago, Illinois: Encyclopaedia Britannica, 1968, 229-258.

Vernon, M.D. Backwardness in Reading. Cambridge: University Press, 1957.

Vernon, M.D. Psychology of Perception. Great Britain: C. Nicholls and Company Ltd., 1962.

Vygotsky, L. Thought and Language. Cambridge, Mass.: The M.I.T. Press, 1962.

Wepman, J.M. Auditory Discrimination Speech and Reading. The Elementary School Journal, 60 (March 1960), 325-333.

Wepman, J.M. The Interrelationship of Hearing, Speech and Reading. Reading Teacher. 14:245. March 1961.

Williams, F. (ed.) An Analysis of the Variations from Standard English Pronunciation in the Phonetic Performance of the Two Groups of Non-standard English-speaking Children - Final Report. Texas University, Austin, Centre for Communication Research, 1971. ED 064 751.

Willink, Elizabeth W. Bilingual Education for Navajo Children. In P.R. Turner, ed. Bilingualism in the Southwest. Tucson, Arizona: University of Arizona Press, 1973, 177-190.

Wolfart, C.H. and J.F. Carroll. Meet Cree: A Practical Guide to the Cree Language. University of Alberta Press, 1973.

Wolfram, W. Socioloinguistic Premises and the Nature of Non-standard Dialects. The Speech Teacher (September 1970), 177-184.

Wolfram, W. Socioloinguistic Alternatives in Teaching Reading to Non-standard Speakers. Reading Research Quarterly, 6 (Fall 1970), 9-33.

Zintz, Miles V. What Classroom Teachers Should Know About Bilingual Education. In Bilingual Education for American Indians. Washington, D.C.: Office of Education Programs, Bureau of Indian Affairs, 1971.

Zintz, Miles V., Marie Luci Ulibarri, and Delores Gonzales. The Implications of Bilingual Education for Developine Multicultural Sensitivity Through Teacher Education. Washington, D.C.: ERIC Clearinghouse on Teacher Education, 1971. ED 054 071.

APPENDICES

APPENDIX A

A FRAMEWORK FOR THE CLASSIFICATION OF THE USES OF LANGUAGE

APPENDIX A

A Framework for the Classification of the Uses of Language

Function	Uses of Language	Strategies
The directive function	1. Self-directing	i monitoring actions ii focusing control iii forward planning
	2. Other directing	i demonstrating ii instructing iii forward planning iv anticipating collaborative action (self and other)
The interpretative function	1. Reporting on present and past experiences	i labelling analytical strategies including ii elaboration of detail iii association and comparison iv recognising incongruity v awareness of sequence vi recognition of associated actions or events vii absence of conditions viii recognition of a central meaning ix reflecting on the meaning of experiences
	2. Reasoning	i recognising dependent and casual relationships ii the recognition of a principle or determining conditions

The projective function	1. Predicting	i forecasting events
		ii anticipating consequences
		iii surveying possible alternatives
		iv forecasting related possibilities
		v recognition of problems and predicting solutions
	2. Empathetic	i projecting into experiences of others
		ii projecting into other people's feelings
		iii anticipating reactions of others
	3. Imaginating	i renaming
		ii commentary on imagined context
		iii building scene through language
		iv language of role (strategies of the directive and interpretative functions will be used within imagined contexts)
The relational function	1. Self-maintaining	i referring to needs
		ii protection of self-interest
		iii justification
		iv criticism
		v threats
	2. Interactional	i self-emphasising strategies
		ii other-recognising strategies

(Tough, 1977, p. 68-69)

APPENDIX B

THE FAST-COSENS PLUS AUDITORY DISCRIMINATION TEST

APPENDIX B

The Fast-Cosens Plus Auditory Discrimination Test

I. Directions for the Fast-Cosens Plus Auditory Discrimination Test

(These directions basically follow the same format as for the Fast-Cosens Auditory Discrimination Test)

The child is seated facing the examiner. The examiner says "I would like to know how well you can listen. To do this I would like to have you listen to words on this tape recorder. A voice will say two words. Sometimes the two words will be exactly the same two words such as my, my. Others will be just a little bit different such as my, by. I would like to have you listen to these two words and tell me if they are the same two words or if they are a little bit different: wide, ride. Are they the same or different?" Give each subject an opportunity to respond. Continue with: "I want you to show me whether the words are the same or different. If the words are the same, keep your hands on your lap. If the words are different, put your hand up. Listen to these two words: Thimble, thimble. Are they the same or different? Show me." If any of the subjects do not make the correct response, repeat the directions. Give the following practice pairs orally correcting errors as they occur.

zip	gyp
fell	fell
nice	knife
raging	rating
paint	faint
licking	licking

Continue with: "Now I would like to have you listen to words on the tape recorder and show me whether they are the same or different. Remember, put your hand up if the words are different and keep your hands on your lap if they are the same." Start the tape recorder but do not record responses until the recorded practice items have been given. The recorded practice items are:

rack	rat
bag	bag
cup	cat
wide	wide
paint	faint
fell	fell

Section II - The Fast-Cosens Plus Auditory Discrimination Test
(Starred items have been added to the original Fast-Cosens Test)

Part I

1. witch wish
2. cap cap
3. ace hace *
4. bug bug
5. pleasure pledger
6. could good *
7. chin chin
8. seed seed
9. θam ǯam *
10. ring wing
11. first thirst
12. wis wisp *
13. volt bolt
14. harsh harsh
15. robe rove *
16. shake shake
17. sheep cheap
18. choke joke *
19. reshine reshine
20. sink sink
21. ran rant *
22. lease leash
23. gaze gaze
24. racing raising *
25. red red
26. hash hatch
27. sile sire *
28. wed wed
29. dare dare
30. river ribber *
31. sheet sheet
32. pie thigh
33. cash cashed *
34. raging raging
35. peeve peeve
36. thistle this"ll *
37. slim sling
38. brimming brimming
39. hum hump
40. nice nice
41. leap weep
42. maθing matting *
43. breed breathe
44. wife wife
45. thigh thy *
46. bad bag
47. thatch thatch
48. myth mitt *
49. shape shape
50. had has
51. sin sinch*
52. region reason
53. mess mess
54. fairy very*
55. cherry sherry
56. lath lash
57. ling link*
58. by by
59. thine vine
60. liver libber*
61. tenth tenth
62. swithes swishes
63. plezzer pleasure*
64. wishing wishing
65. chains change
66. poil foil*
67. swimming swinging
68. swim swim
69. revel rebel*
70. elect erect
71. led led
72. rang rank*
73. boat boat
74. robe rode
75. arm harm*
76. clove clove
77. rocking rotting
78. but bud*
79. van van
80. rash wrath
81. loping loafing*
82. lap lap
83. muscle muffle
84. searching surging*
85. shack sack
86. range range
87. fan van*
88. card card
89. lathe laid
90. limb limp*
91. shin shin
92. bathe bathe
93. grass grasp*
94. then then
95. lath lass
96. sue zoo*
97. lit lit
98. day they
99. facing phasing*
100. way lay

Part I

1, legion legion
2. peek peeg *
3. lash latch
4. by they
5. thick tick *
6. cup cup
7. teething teething
8. father fodder *
9. bid bid
10. lesion legion
11. lub love
12. laid laid
13. simmer simmer
14. etching edging *
15. fought thought
16. ban van
17. tham tam *
18. wrath wrath
19. lass lash
20. feet feed *
21. sack sack
22. fearing feeling
23. cap cab*
24. roughing roughing
25. thought thought
26. wreath wreathe*
27. thin thin
28. mesh mess
29. spice spies*
30. lap rap
31. rub rub
32. half have*
33. rap wrath
34. day day
35. nothing nutting*
36. popping potting
37. sherry sherry
38. pounce bounce*
39. thatch patch
40. ring ring
41. put foot*
42. reason reason
43. has has
44. dapple dabble*
45. pick thick
46. grease grease
47. push bush*
48. muff muff
49. ran rang
50. bucking bugging*
51. pie pie
52. peep peep
53. kill gill*
54. raising raging
55. push push
56. lit lid*
57. cheat sheet
58. bat bat
59. cheer jeer*
60. lit lick
61. leap leap
62. rip rib*
63. thy vie
64. cashing cashing
65. ruse rouge*
66. rains range
67. brimming bringing
68. cal gal*
69. slim slim
70. cad cad
71. rich ridge*
72. clove clothe
73. waking waiting
74. lass last*
75. vow vow
76. hearth harsh
77. other udder*
78. rate rate
79. shake sake
80. refuse reviews*
81. page page
82. had had
83. see zee*
84. bathe bade
85. thy thy
86. ran ranch*
87. tenth tense
88. sing sing
89. heaθer heaðer*
90. dare there
91. lot lot
92. pest best*
93. wait late
94. elect elect
95. splash splashed*
96.. pleasure pleasure
97. sinner sinner
98. lunching lunging*
99. mush muff
100. bath bath

Part II

1. fish fished*
2. shief thief
3. muss muff
4. lacking lagging*
5. cad cab
6. pushy pushy
7. lope lobe*
8. cashing catching
9. reep reep
10. real rear*
11. feeling feeling
12. grief grease
13. worthy wordy*
14. thorn thorn
15. waking waking
16. linn lint*
17. winning winging
18. popping popping
19. pill fill*
20. roughing rushing
21. clang clang
22. pricing prizing*
23. page pays
24. rate late
25. siege seeds*
26. sun sung
27. thy thy
28. sing sink*
29. bail vale
30. rub rug
31. sing zing*
32. half hash
33. raft raft
34. few view*
35. fence thence
36. rung rum
37. lapping laughing*
38. cuffing cuffing
39. beater beaker
40. lis lisp*
41. lot lock
42. peak peep
43. mezzer measure*
44. wing wing
45. naval naval
46. copy coffee*
47. arriving arising
48. thy die
49. talk dock*
50. has have
51. lasses lashes
52. tile dial*
53. thigh thigh
54. fought fought
55. pass past*
56. cog cob
57. hopper hotter
58. back bag*
59. crutches crutches
60. bat that
61. infested invested*
62. pass pass
63. big bid
64. ice eyes*
65. singer simmer
66. chat chap
67. fuss fussed*
68. lathe lave
69. dish dish
70. rating raiding*
71. after aster
72. vow thou
73. cherry jerry*
74. sought thought
75. buzz buzz
76. roping robing*
77. wag rag
78. lashing laughing
79. wriθing writing*
80. closing clothing
81. late late
82. simple symbol*
83. lens lend
84. lash lash
85. search surge*
86. rising rising
87. wins wins
88. hiss his*
89. thank shank
90. rig rig
91. mouth mouth
92. sheep sheath
93. latch latch
94. plan plant*
95. pup puff
96. winging winging
97. tacking tagging*
98. aster aster
99. witches wishes
100 dock dog*

Part II

1. web wed
2. lease lease
3. teeth teethe*
4. cope dope
5. puff puff
6. faith fate *
7. shoot shoot
8. laugh lash
9. age aids*
10. sheep sheep
11. closing closing
12. pits pitch *
13. leaf lease
14. thief thief
15. linn lynch *
16. hash hash
17. beaker beaker
18. mats match *
19. sinner singer
20. upper upper
21. eats each *
22. refine reshine
23. swinging swinging
24. three tree*
25. thin thin
26. gaze gaze
27. leaf leave*
28. lashing lashing
29. red led
30. miff miv*
31. win wing
32. tug tub
33. cinch singe*
34. lasses lasses
45 clam clang
36. wedge weds*
37. muffle muffle
38. lake late
39. shape shake
40. rack rack
41 mum mump*
42. thimble symbol
43. sung sung
44. writing riding*
45. arising arising
46. naval nasal
47. rifle rival*
48. shot shop
49. peeve pease
50. weaθer weaðer*
51 hotter hotter
52. pussy pushy
53. town down*
54. first first
55. thence thence
56. owl howl*
57. bolt bolt
58. slitting slipping
59. heart hearth*
60. switches switches
61. chat chat
62. biting biding*
63. thee be
64. mouse mouse
65. tile tire*
66. led leg
67. laugh laugh
68. rotting rotting
69. vale vale
70. ether either *
71. sift shift
72. cap cat
73. dub dove*
74. lathe lathe
75. cuffing cussing
76. there there
77. sink think
78. raft waft
79. rising writhing
80. wind wins
81. wag wag
82. teething teasing
83. shin thin
84. cog cog
85. wreath reap
86. soak soak
87. wish wish
88. leap leaf
89. pass path